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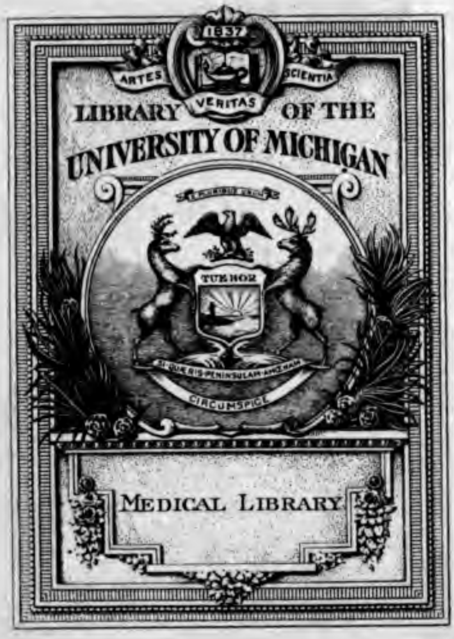

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DR. WILLIAM A. APPLEGATE

Born at Yellow Springs, Ohio, November 10, 1857. Preliminary education at Antioch College, Yellow Springs. Graduated from medical department of Harvard University in Boston, in 1882. Located in Chattanooga in 1891. Was appointed assistant surgeon of the Southern and A. G. S. Railways, May 15, 1901. Was appointed Chief Surgeon of the Southern Railway, March 15, 1905.

TENTH ANNUAL MEETING

OF THE

ASSOCIATION OF SURGEONS

OF THE

SOUTHERN RAILWAY COMPANY

CHATTANOOGA, TENN.

MAY 24-25, 1905

PUBLISHED BY
THE INTERNATIONAL JOURNAL OF SURGERY CO.
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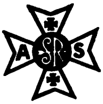

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TENTH ANNUAL MEETING

OF

THE ASSOCIATION OF SURGEONS

OF THE

SOUTHERN RAILWAY COMPANY.

Chattanooga, Tenn., May 24, 1905.

Morning Session—First Day.

The Association convened in the Assembly Hall of the Read House, and was called to order at 10 a. m. by the Chairman of the Committee of Arrangements, Surgeon W. A. Applegate.

Prayer was offered by Dr. J. W. Bachman, pastor of the First Presbyterian Church of Chattanooga.

The Address of Welcome was delivered by Hon. A. W. Chambliss, Mayor of Chattanooga, as follows:

"Chattanooga is bound to the Southern Railway by many ties, and on behalf of the people of Chatanooga I welcome you to our gates. We are all glad to see you this morning and hope that your stay in Chattanooga will be pleasant in every particular. What you will see here you will be impressed with, and the scenery and surroundings are the most beautiful anywhere to be found. Chattanooga is, in our opinion, the most beautiful spot in the world, and we want you to go away feeling that it is all that we claim for it.

"It is a blessed thing that your part in life is to help others, and to give us life. We all love this life, and we want life more abundantly, and you give this to us, as it is fresher than the life to come. Your profession is a most noble one and devoted to the sacred duty of preserving life for your fellowmen. All about you here are scenes of the great battles of the late war and the government has helped us to make these spots attractive, and we are proud of our homes. I hope your programme will prove profitable as it indicates, and that your visit will be so pleasant that you will come again."

The Address of Welcome from the Chattanooga Medical Society was delivered by Dr. J. R. Rathmell, ex-President Chattanooga Medical Society, as follows:

DR. RATHMELL'S WELCOME.

As a representative of the medical profession of Chattanooga the task of giving welcome to your coming has been assigned me.

The duty is a pleasant one and not arduous, for I well know how unwelcome a long word welcome would prove itself to be to a body of medical men, whose earliest teaching has been the precept "to look wise and say little."

It seems to me a spoken welcome is really unnecessary. For those who know say that this is a great big hearted city, whose doors are always open and whose hands are extended in kindness to all good men and great. Our city stands for old-time hospitality. But it also stands for progress, spelling that word with capitals to give it emphasis. Every movement in and about our city is stamped with the word "strenuous."

Our business men walk rapidly, the wheels of the factories hum loud and whirl swiftly; the locomotives going out on their journeys hauling the products of our city move hurriedly and returning come in with increased velocity.

To see the many lines of railway coming from all directions, converging like great nerve-tracts to their ganglion, impresses us with the belief that Chattanooga has become one of the great nerve centers of our nation. Every muscle and every sinew of our business body has always been in the highest state of activity and has been toughened and made strong with an inextinguishable vitality.

Our people waste no time in sentiment, nor in loitering. But our city, busy as she is, has time to welcome all organizations of workers, whether their object be for civic, social, political, religious or scientific uplift. Therefore with authority, I greet you gladly.

The system whose interests you cherish has seen fit to choose one to be at their head in medical affairs from out our midst and from the very condition I have just mentioned.

The medical profession of Chattanooga is glad that so great a man being needed, the Southern Railway system found him here in no less a man than William A. Applegate.

You are welcome again because of the responsible position you occupy. Numskulls and ignoramuses sometimes get into responsible places, but they do not stay long when once such scrutiny of conduct and tests of ability are applied to them that are employed by the Southern Railway Company, I am certain, therefore, that good sense, good judgment and a correct knowledge of the character of the healing agents and appliances employed have led to the right results, else you would not be here to-day.

Again you are welcome because you belong to the great medical profession, composed as it is of its hundreds of thousands of adherents. The same motives prompting any medical man anywhere to do his duty, prompt you, and though you are somewhat specific in your limitations, you are not limited in your responsibility.

The best gifts to a great nation are the gifts of honest, upright, progressive, intellectual, noble men, and this applies whether they be for statesmen, rulers, financiers or surgeons. Such men never compromise their character for any temporary advantage over others. This great profession furnishes the opportunity for the development of the power of self-help. Gladstone said "that self-help makes the man and man making is the aim that the Almighty has everywhere impressed upon creation." There is no business man of whom more self-help is required and self-reliance demanded than the railroad surgeon.

Place him, as it often happens, where steady nerve, sound judgment, intelligent action and best service are needed, and if he is not the man for the place it will quickly show itself. This is the school that gives edge to his knowledge. It is these various experiences that give the features of the medical man, whether he be a surgeon, specialist or a general practitioner, a certain unmistakable air of self-reliance or self-sufficiency. It is this calm, resolute, defiant, independent demeanor which unconsciously wins respect. This applies to the members of this association as well as others.

While I am aware that you are not in the employment of the Southern for pure philanthrophy, nor alone for experience nor the money you get—my understanding being that none of you are over paid—yet you are actuated by the same general motives, resting upon the same general principles, that move the whole profession, namely, a mixture of all those reasons resulting in the best service for the needy.

While I am in full sympathy with the enthusiastic young physician who, to get practice, has the spirit to do most anything to secure it, and knowing well that all medical men must have business in order to live, yet I confess I do not want the experience of the doctor whose epitaph may run as follows:

"Here lies the body of a medical man,
The 'white horse' appeared and off with him ran.
But his body was so full of leaven
It went straight up to the gates of heaven;
And at the key-hole, peeping through,
Of the promised land gained a bird's-eye view.
But finding no one there
The least in need of professional care,
It fell straightway to the place below,
That dismal region of perpetual woe.
Oh! it cried, what a kingdom is this,
Truly for a doctor here is bliss,
For all are found indeed most willing
To be practised upon by the art of killing."

To have absolute relief from the cares of routine business at home; to be encouraged and stimulated in your mental life by the excellent work you do on this

occasion; to become more beautiful and refined in life by the inspiring scenery and surroundings of our city, are the good wishes of the local medical profession.

Gentlemen, members of the Association of Surgeons of the Southern Railway Company, your wives, sweethearts and all visiting physicians, you are welcome to Chattanooga.

The response to the Address of Welcome was delivered by Surgeon J. J. Harrison Jr., of Loudon, Tenn., as follows:

DR. HARRISON'S RESPONSE.

Mr. President, Ladies and Gentlemen:

Once again, in the Providence of Almighty God, we have been permitted to assemble together as surgeons and by contact and association, to cement and weld more tightly the bands of love encircling us and the friendships and ties of days past and forever gone.

Two years ago we met upon the wave-washed shores of Old Point Comfort, within sight and view of "Hampton Roads," and of a storm-tossed, heaving bosom of a mighty ocean.

Scarce twelve months with their lights and shadows, their oft receiving periods of sunshine and storm, have elapsed since the loving arms of a welcoming southland were thrown around us and at Atlanta, close the throbbing heart of our beloved Dixie, we say the white-capped fields of cotton, revelled in the magnolia's sweet perfume and in the tender carols of innumerable feathered songsters.

But in this good year, 1905, an East Tennessee city, famous in history, story and song, welcomes us as guests, and opens wide her hospitable doors for our unlimited enjoyment and entertainment.

For the gracious words of welcome spoken by Chattanooga, through the lips of her eloquent son who has just preceded me, we return sincere and earnest thanks and gladly accept the favors and courtesies so freely offered and so generously extended.

Through all the decades of the past no city can compare with Chattanooga in industrial or civic progress in times of peace or exhibited greater, grander deeds of heroism and valor when the dogs of war were unleashed and strife and carnage made of her a vast and bloody battlefield.

Less than a half a century ago she was but the helpless, cringing plaything of "grim-visaged" war. Her peace destroyed by the thunder of opposing cannon and the steady, relentless "tramp, tramp, tramp" of the rough-shod, marching thousands.

From the cloud-bathed lofty top of "Old Lookout," there has come down to her the discordant, horrible sounds of battle, and at gory Chickamauga she has *seen father thirsting* **for the blood of son and a brother**

dye his gauntleted hand in a brother's precious, crimson heart's blood.

But it is of this city's wonderful "victories of peace" to which I desire to especially allude, and to illustrate the same, let us compare, for a moment, her condition at the close of the civil war, and her condition at the present time. Oh, what a contrast! The magic wand of the East Indian magician, which, at a single movement, transforms the ugly, loathesome object into a thing of startling beauty, performs no greater, no more potent miracle, than has been wrought in the working of this proud and queenly city.

Where in 1865 an insignificant shell-dismantled village struggled to free and rid itself of the innumerable ravages of war, there stands to-day one of the fairest, most priceless gems in the coronet encircling Dixie's fair brow, which with Mobile, Atlanta, Memphis and New Orleans and others, made up a galaxy of southern cities of which any land or people might pardonably feel proud.

At Chickamauga, where once thousands of brave soldier boys lay stiff and cold upon the green sward gazing with wide-open eyes, but seeing not, into the star-studded dome of blue, now tapering monuments of marble and granite rear their graceful heads heavenward in commemoration of the daring and valor of the men in blue and the men in gray, who freely died at their country's bugle call.

The roar of artillery and the rattle of musketry has been succeeded by the material music of shuttle and of loom. And stately business blocks and lovely homes testify in immeasured terms of the happiness and prosperity of this people. The sweet chimes of church and school bells demonstrate that the worship of the living God and the cause of education are not neglected.

With her dozen lines of steam railway, with her feet washed by the murmuring water of the Tennessee river, her unsurpassed natural wealth and advantages, and the nation famed pluck, energy and ability of her denizens, her future is assured. A future, roseate with the beams of hope and effulgent with the glorious rays of the sun of prosperity.

May old Lookout, as she stands a tireless, patient, silent sentinel, keeping constant watch and guard over Chattanooga, the priceless treasure at his feet, witness no backward turn, but may he ever see her advance toward and upward in every element which makes for civic honor and glory and for the perfect righteousness and happiness of her people.

Once more allow me, Mayor Chambliss, in behalf of the Association of Surgeons of the Southern Railway Company, to thank you again and again for your unbounded hospitality and most gracious welcome to this beautiful city, which is indeed and truth a city of many conventions, and to assure you that this felicitious welcome shall always linger with us as one of the sweetest memories connected with our lives as Southern Railway surgeons.

And in response to the brotherly love and fraternal greeting of the Chattanooga Medical Society which has been so eloquently and candidly expressed to us by the representative of this organization, we return our tenderest and most heartfelt thanks and appreciation and accept in the same spirit as tended these tokens of brotherly love and friendship, and during our sojourn here we invite the members of the medical profession of this city to meet with us and take part in the discussions and deliberations of this body. And we assure them of a cordial welcome and a hearty grasp of the right hand of good fellowship.

In conclusion, my friends, allow me to extend love and greetings to the wives and daughters of the members of this association, who meet with us to-day.

In the "olden times" woman was but little better than a slave, the helpless victim of man's untrammeled whims and caprices, and this unhappy condition prevailed until the lowering murky clouds of ignorance, superstition and vice were dispelled by the brilliant rays of the sunlight of Christianity, and when this curtain of blackness had been lifted woman stood revealed in all her beauty and purity, the sweetest, dearest and best of God's creation.

"For woman, she has all that's blest a magic to enthrall
For nature formed her as the best and fairest work of all."

And in this, the twentieth century of the world's history, she sits a gracious queen indeed and with her golden sceptre of love, rules and sways humanity.

We thank her for her presence here and as suppliants at her mighty throne, but one favor do we crave, that she will continue to let the light of her gracious countenance fall upon us, thereby adding to this meeting manifold beauties and countless charms.

At the conclusion of these addresses the President of the Association, Dr. W. W. Harper, of Selma, Ala., was called to the chair to assume the gavel and present the annual address of the President, as follows:

PRESIDENT HARPER'S ADDRESS.

Fellow Members—Standing in the midst of so many worthy surgeons, I am deeply conscious of the great honor you conferred upon me a year ago in electing me your president. I desire to thank you for the loyal and hearty manner in which you have upheld my hands. If during the past year the association has prospered and advanced in scientific attainments, it has done so through the active and zealous work of its members. Never before has it stood for more. Born of such parents as Ford, Satterwhite, Dean and Day, fondly reared by Ross, Baxter and Broadnax, spanked by the *venerable* (?) Connolly and tutored by Hancock and

Miller, the lusty babe has grown to be a promising man and by sheer merit has forged his way to the front ranks of the best. And yet there are some who refuse to join our ranks because they say it does them no good and they see no results. They always reach the station just as the train of opportunity has passed. They oppose organization and point with the finger of pride to our great-grandfather Adam, who stood in his class, all to himself, and boasted of not a rival in the world. But one beautiful spring morning when all nature was clad in her Easter garb and every bird carrolled his latest song from the top of some far-distant pine, instead of being a mute decoration on the top of some fair lady's head, Adam awoke from a restless sleep and strolled through the royal gardens. He loitered here to gather fragrance from some blushing violet or stopped yonder to feast his eyes on some gorgeous rose. "How sweet were the scenes on every hand. How fair were the covering skies." But quickly sped the daylight hours, and soon the shades of evening drew to a close and Adam homeward went his way.

But no children ran to greet the sire's return, and feel in his pockets each envied penny to share, for like his back, Adam's purse was bare.

Alas! There was not a woman in all the land to help Mr. Adam unbutton his collar band and to remove his pair of spurs, the only dress of that day. There were no strings tied to him, no ruffled female voice to demand an accounting for his late hours at the club. But Adam was so unhappy over his lonely estate that the next day he entered the hospital and parted with one of his ribs in order to form an association of talking members. The wisdom of his decision is attested by a thousand smiles and his praises sung by a million tongues. Let us emulate his example and have more talk in our meetings. Let us have a good old-fashioned Methodist conference, where every fellow feels that the meeting would have been a failure unless he had addressed the chair. If properly used, these meetings become post-graduate schools, where each member is teacher and scholar alternately. If the three hundred surgeons employed by the Southern Railway should attend and give a single new idea, he would receive in return two hundred and ninety-nine, a compound interest on his investment. We may, through reading, gather much information; but it is only by coming into actual contact with men that we know how they think and act. Again, we are living in a strenuous age where men chase dollars like boys chase butterflies, and if the busy doctor is to avoid an untimely end, he must take a recreation and these meetings are golden opportunities for you to lay aside your arduous duties and bid dull care good bye for a while. The railroad company furnishes transportation not only for yourself, but for your families and bid you go and be renewed in body and mind that they may the longer have the service of so valuable a surgeon. Then again, doctor, your patient is entitled to a chance

to recover. Perhaps he may fall into the hands of a confere and for the first time have an opportunity to appreciate his own good doctor. He will be glad to see you again. If he is not, the undertaker may, for this latter gentleman noted your absence by a decrease in his receipts.

A third reason for attendance is that the association needs you. In unity there is strength and concerted action moves the world. For several years this association clamored for a chief. Our petition has been heard, and the Southern Railway has done itself proud and honored us in selecting for the head of its surgical department a member from our own ranks. With such a chief as Dr. W. A. Applegate, we shall press forward to greater victories.

While a good general is a necessity, much depends upon the men in the trenches. Every one of us should feel that he is an essential link in the chain of success. Each should vie with his fellow in the thorough performance of duty. By such individual and united work we will maintain the best and most efficient service. This naturally suggests the question, "How may we increase the usefulness of the association?" By urging upon its members the keeping of accurate case records. We are wont to keep the records of patients with severe injuries, but too often pay very little attention to minor accidents. Herein lies a mistake, for the minor ones are much more numerous, oftentimes present the most interesting data, and are frequently the most troublesome for the legal department to adjust, and the surgeon is frequently to blame because he knows so little about the case. Therefore let me urge that in the future you keep an accurate history of every case.

At the conclusion of the President's Address Dr. Geo. R. Dean, of Spartanburg, S. C., moved that the Association tender their thanks to the President for his most excellent address, and that it be referred to a special committee to report during the afternoon. This motion was carried unanimously.

Dr. Baxter moved that the members of the Chattanooga Medical Society, and all visiting doctors, be extended the privileges of the floor, and be urged to take part in the proceedings. Carried.

Dr. Geo. Ross, of Richmond, Va., called attention to the non-appearance of some of the papers in the transactions of the Association, and urged that the members be requested to place their papers in the hands of the Publication Committee, that they might *appear in the* Transactions.

The President appointed Dr. Turner as Sergeant-at-Arms.

Dr. W. A. Applegate, as Chairman of the Committee on Arrangements, reported that he had secured the hall at the Read House for the meetings of the Association, and named the different places where the members could secure accommodations during the sessions of the meeting, and that arrangements had been made for trips to Lookout Mountain, Missionary Ridge and Chickamauga Park.

President Harper announced that he had appointed a Grievance Committee, as follows:

Dr. Thos. H. Hancock, Atlanta, Ga.

Dr. F. R. Gobbell, English, Ind.

Dr. W. A. Applegate, Chattanooga, Tenn.

The President also announced the following Committees:

COMMITTEE ON NEW MEMBERS.

Dr. C. I. Pegues, Safford, Ala.
Dr. Ambrose McCoy, Jackson, Tenn.
Dr. J. H. Mitchell, Mt. Vernon, Ill.

COMMITTEE ON ARRANGEMENTS.

Dr. W. A. Applegate, Chattanooga, Tenn.
Dr. T. H. Hancock, Atlanta, Ga.
Dr. G. A. Baxter, Chattanooga, Tenn.

COMMITTEE ON PROGRAMME.

Dr. S. R. Miller, Knoxville, Tenn.
Dr. W. G. Summerville, Tuscaloosa, Ala.
Dr. J. U. Ray, Woodstock, Ala.

AUDITING COMMITTEE.

Dr. J. F. Curtis, Blockton, Ala.
Dr. R. J. Noble, Selma, N. C.
Dr. Geo. R. Dean, Spartanburg, S. C.

COMMITTEE ON NECROLOGY.

Dr. G. M. Burdette, Lenoir City, Tenn.
Dr. W. M. Cunningham, Corona, Ala.
Dr. E. L. Givan, Montevallo, Ala.

COMMITTEE ON PUBLICATION.

Dr. S. R. Miller, Knoxville, Tenn.
Dr. T. P. Satterwhite, Louisville, Ky.
Dr. J. U. Ray, Woodstock, Ala.

Dr. T. P. Satterwhite, of Louisville, Ky., called attention to the fact that the next place of meeting for the Association was to be selected on the first day of meeting. This was referred to the Executive Committee.

Dr. S. R. Miller, of Knoxville, Tenn., moved that the Association adjourn immediately after the reading of the reports of all the committees, and reassemble promptly at 2:00 P. M. to take up the regular programme of reading papers. Motion carried.

Dr. J. U. Ray, of Woodstock, Ala., presented his report as Secretary and Treasurer of the Association, as follows:

Chattanooga, Tenn., May 2nd., 1905.

Mr. President:

Gentlemen of the Association—I beg leave to submit the following as my Annual Report from May 19th, 1904, to May 2d, 1905:

I have written 821 letters.

Mailed 55 copies of Transactions,
" 285 Circulars,
" 281 Preliminary Programmes,
" 294 Programmes,
" 5 Packages of papers to International Journal of Surgery.

Dues collected from members	$544.75
Amount from temporary members	42.00
Amount received from former Secretary and Treasurer	9.19
Total receipts	$595.94
Less amount paid out as per attached list	584.71
Cash on hand	$11.23

We, the Auditing Committee, find the above to be correct.

J. F. CURTIS,
G. R. DEAN,
R. J. NOBLE,
Committee.

Chattanooga, Tenn., May 2nd., 1905.

The report was adopted.

Woodstock, Ala., May 2, 1905.

Disbursements.

1904.		
May 19.	Inter. Journal Surgery, for 200 reprints	$8.00
"	Inter. Journal Surgery, 150 Transactions	37.50
"	J. R. Slide, for Printing Programmes and Badges	14.00

May	20.—Inter. Journal Surgery, Balance on "Harrison" list	24.00
"	C. A. Smith, Balance due for reporting 1902 Meeting	50.00
"	Pinnacle Trunk Co., 1 Telescope	.75
June	4.—Roberts & Son, Letter Heads and Envelopes	6.50
"	6.—Southern Express Co., Expressage	.30
"	3.—Inter. Journal Surgery, 7 New Members	7.00
"	24.—Inter. Journal Surgery, on old account	80.00
July	13.—Inter. Journal Surgery, 1 New Member and on old account	25.00
"	19.—Inter. Journal Surgery, old account.	28.00
Aug.	12.—Inter. Journal Surgery, old account.	87.00
"	27.—Inter. Journal Surgery, six New Members	6.00
Sept.	15.—Inter. Journal Surgery, three New Members	3.00
"	22.—Inter. Journal Surgery, Current Year	50.00
"	22.—Inter. Journal Surgery, three New Members	3.00
"	30.—Inter. Journal Surgery, three New Members	3.00
Oct.	4.—Inter. Journal Surgery, Current Year	50.00
Nov.	14.—J. D. Herrman, refund	6.00
"	14.—Inter. Journal Surgery, one New Member, 1 Old Account, 20, Current Year	22.00
1905.		
Jan.	3.—Inter. Journal Surgery, 2 New Members, 1, Old Account	3.00
"	20.—Inter. Journal Surgery, 1 New Member, 17, Current Year	18.00
Mar.	2.—Roberts & Son, 1,000 Receipts	3.50
Feb.	28.—Southern Express Co., Expressage	.25
Mar.	25.—Inter. Journal Surgery, 2 New Members	2.00
April	11.—Inter. Journal Surgery, 10 Current Year	10.00
"	18.—Dispatch Printing Co., Circulars, Preliminary Programmes, etc	8.75
"	24.—Southern Express Co., Expressage on Programmes from Knoxville	.75
May	2.—Postage during year	27.41
		$584.71

On motion of Dr. Baxter, the report of the Secretary and Treasurer was referred to the Auditing Committee.

The report of the Committee on Program was made by Dr. S. R. Miller, as follows:

ORDER OF EXERCISES.

Tuesday, May 2, 1905.

9 a. m.—Registration of each person (member, guest or lady) at Secretary's desk in Assembly Hall.

10 a. m.—Call to Order....By Surgeon W. A. Applegate
Chairman of Committee on Arrangements.

Prayer.............................Dr. J. W. Bachman
Pastor First Presbyterian Church.

Address of Welcome...........Hon. A. W. Chambliss
Mayor of Chattanooga.

Welcome from Chattanooga Medical Society
.............................Dr. J. R. Rathmell
Ex-Pres. Chattanooga Medical Society.

Response to Welcome...........Surgeon J. J. Harrison
Loudon, Tenn.

Report of Committee on Arrangements.

Introduction of President.

President's Address............Surgeon W. W. Harper
Selma, Ala.

Report of Committee on Programme.

Report of Committee on New Members.

Report of Committee on Necrology.

Report of Executive Committee.

Report of Secretary and Treasurer.

"Double Fracture of Lower Jaw"................
..........Surgeon A. J. Mathews, Elberton, Ga.

To open discussion.................Surgeon W. C. Day
Danville, Va.

"Partial Intercapsular Fracture of Femur"—
Report of two cases......................
......Surgeon G. Pressley Neel, Greenwood, S. C.

To open discussion...............Surgeon G. A. Baxter
Chattanooga, Tenn.

"Fracture of Lower Third of Ulna".............
....Surgeon H. T. A. Lemon, Washington, D. C.

To open discussion..........Surgeon Thos. H. Hancock
Atlanta, Ga.

"Wire Splint in Compound Comminuted Fractures"..Surgeon T. R. Whitley, Douglasville, Ga.

To open discussion..............Surgeon F. S. Kendall
Columbia, S. C.

"Fractures of the Femur and Their Treatment; with a Plaster of Paris Splint on a Double Incline Plane" ....
............Dr. J. H. Downey, New Holland, Ga.

To open discussion................Surgeon J. W. Oslin
Gainesville, Ga.

"Fractures of Skull"..Surgeon R. J. Noble, Selma, N. C.

To open discussion............Surgeon H. J. Williams
Macon, Ga.

"Head Injuries and Cases"....................
........Surgeon W. S. Wiatt, East St. Louis, Ill.
To open discussion..............Surgeon Rhett Goode
Mobile, Ala.

"Concussion of Brain"..........................
..........Surgeon J. H. Mitchell, Mt. Vernon, Ill.
To open discussion..........Surgeon DeSaussure Ford
Augusta, Ga.

"The Diagnosis and Prognosis of the Unconscious State in Cases of Injury"...........
..........Surgeon S. R. Miller, Knoxville, Tenn.
To open discussion.............Surgeon M. W. O'Brien
Alexandria, Va.

"Thrombus"..Surgeon T. P. Satterwhite, Louisville, Ky.
To open discussion.........Surgeon Jno. G. Broodnax
Greensboro, N. C.

"Sprains of Ankle"..............................
..............Surgeon C. I. Pegues, Safford, Ala.
To open discussion............Surgeon C. O. Boynton
Sparta, Ill.

"Treatment of Burns and Scalds"...............
....Surgeon E. M. Magruder, Charlottesville, Va.
To open discussion............Surgeon G. B. Copeland
Birmingham, Ala.

"Burns and Their Treatment"...................
........Surgeon Ambrose McCoy, Jackson, Tenn.
To open discussion...............Surgeon T. J. Happle
Trenton, Tenn.

"Angioma of Scalp; Cure by Hot Water Injection"..Surgeon B. G. Copeland, Birmingham, Ala.
To open discussion.............Surgeon S. R. Miller
Knoxville, Tenn.

"Employment of Celluloid Plates for Correcting Deficiencies of Skull, Operative or Accidental" ....Dr. Wm. Perrin Nicolson, Atlanta, Ga.
Prof. of Anatomy, College of Physicians and Surgeons.
To open discussion....................Dr. Duncan Eve
Chief Surgeon of N. C. & St. L. Ry.,
Nashville, Tenn.

"Traumatic Neuroses of Hysteria Type"........
...............Dr. E. D. Bondurant, Mobile, Ala.
Prof. Neurology, Mobile Medical College.
To open discussion...................Dr. M. Campbell
Knoxville, Tenn.
Prof. Mental Diseases, Tenn. Medical College.

"Focal Traumatic Diseases of the Brain"........
.............Dr. S. G. C. Pinckney, Atlanta, Ga.
To open discussion..........Surgeon G. B. Thornton
Memphis, Tenn.

"Abdominal Trauma"............Dr. Floyd W. McRea
Atlanta, Ga.
Prof. of Abdominal Surgery, College of Physicians and Surgeons.

To open discussion................Surgeon Geo. Ross
Richmond, Va.

SPECIAL ORDER FOR 8 P. M., MAY 3.

"The Relations of the Surgical and Legal Departments"..............Hon. Sanders McDaniel
Division Counsel, Atlanta, Ga.

An address: (Title to be announced)............
.............................Hon. L. E. Jeffries
Division Counsel, Selma, Ala.

"The Relation of the Chief Surgeon to the Surgical Department" ....
..................Chief Surgeon W. A. Applegate
Chattanooga, Tenn.

"Some Suggestions to Our Chief Surgeon"......
............Surgeon W. K. Vance, Bristol, Tenn.

"Time and Indications for Amputation".........
........Dr. E. Denegre Martin, New Orleans, La.
Chief Surgeon N. O. & N. E. Ry.

To open discussion...........Surgeon Geo. H. Moran
Morganton, N. C.

"First Aid to and Initial Report of the Injured in Railroad Cases"........................
......Surgeon G. B. Thornton, Memphis, Tenn.

To open discussion............Surgeon H. T. A. Lemon
Washington, D. C.

"Amputation of Both Legs in Typhoid Fever; Recovery" ....
..........Surgeon F. D. Kendall, Columbia, S. C.

To open discussion...............Surgeon W. K. Vance
Bristol, Tenn.

"Amputation of Leg"..........................
.............Surgeon T. H. Hancock, Atlanta, Ga.

To open discussion...........Surgeon G. M. Bazemore
Cleveland, Tenn.

"Penetrating Wounds of the Eye".............
.........Surgeon M. W. O'Brien, Alexandria, Va.

"First Aid to Injured Eye"....................
...........Surgeon M. F. Coomes, Louisville, Ky.

To open discussion...............Surgeon W. S. Wiatt
East St. Louis, Ill.

"Some Observations Upon Eye Injuries"........
..............Surgeon Dunbar Roy, Atlanta, Ga.

To open discussion..................Surgeon H. McHatton
Macon, Ga.

"Eneucleation of Eye"..........................
.............Surgeon J. A. White, Richmond, Va.

To open discussion..............Surgeon J. H. Shorter
Macon, Ga.

"Secondary Closure of Abdominal Incision After Drainage; the Best Means of Preventing Hernia" ....
..............Surgeon R. L. Payne, Norfolk, Va.

To open discussion...............Surgeon Samuel Lile
Lynchburg, Va.

"X-Ray in Surgery"..............................
........Surgeon R. C. Falconer, Lexington, Ky.

To open discussion..............Surgeon R. L. Payne
Norfolk, Va.

"Conservative Railway Surgery with Special Reference to Rest, Drainage, Skin Grafting and the Wet Pack".......................
......Surgeon Geo. E. Davis, Lawrenceburg, Ky.

To open discussion......................G. W. Blanton
Brunswick, Ga.

"Shock"........Surgeon H. W. Rencher, Scooba, Miss.

To open discussion.............Surgeon R. S. Toombs
Greenville, Miss.

"Shock and Its Treatment"......................
............Surgeon R. C. Smith, Newport, Tenn.

To open discussion..................Surgeon C. P. Fox
Greeneville, Tenn.

"Damage Suits Following Railway Injuries—Illustrative Cases" ....
..............Surgeon C. P. Gordon, Dalton, Ga.

To open discussion...................Surgeon Conally
Dallas, Ga.

"Anaesthesia"........Surgeon W. C. Day, Danville, Va.

To open discussion...........Surgeon Herbert Royster
Raleigh, N. C.

"Antisepsis in Railway Surgery"...............
......Surgeon H. C. Crelly, Vinegar Bend, Ala.

To open discussion........Surgeon J. J. Harrison, Jr.
Loudon, Tenn.

Report of Case...............Surgeon R. S. Stuart, Va.

To open discussion.................Surgeon Joel Hill
Lexington, N. C.

The report of the Committee on Necrology was presented by Dr. Burdette, as follows:

J. W. Ashe, Springville, Ala., died June 25th, 1902.

Hugh Burford, Brunswick, Ga., died December, 1903.

J. K. Hardwick, Marshall, N. C., died May 10th, 1903.

Keith Fonde, Citronelle, Ala., died October 10th, 1902.

I. D. Morgan, Eutaw, Ala., died September 17th, 1903.

F. W. Runyan, Austell, Ga., died August 12th, 1903.

C. W. Sibley, Fairfield, Ill., died, date not known.

Wm. O'Daniel, Bullards, Ga., died May, 1903.

John McJunkins, Toccoa, Ga., died 1903 (date not known.)

Dr. W. C. Day, as Chairman of the Executive Committee, announced that Augusta, Ga., was found to be inaccessible to many members of the Association, and therefore, at the suggestion of Chief Surgeon Applegate, the Committee changed the meeting place to Chattanooga for the present sessions.

Dr. C. I. Pegues, as Chairman of the Committee on New Members made the following report, which was adopted.

The Committee on New Members finds that the following have complied with the By-laws of the Association, and respectfully asks that they be elected members of same:

M. R. Bruin,	Strasburg, Va.
H. S. Belt,	South Boston, Va.
W. C. Orr,	Leesburg, Va.
Frank Roberts,	Marshall, N. C.
R. B. Cloud,	Austell, Ga.
R. J. Griffin,	Moundville, Ala.
W. F. Merchant,	Manchester, Va.
I. J. Shepherd,	Lafollette, Tenn.
D. K. Briggs,	Blackville, S. C.
W. W. Owens,	Savannah, Ga.
T. L. H. Cook,	Artesia, Miss.
C. O. Boynton,	Sparta, Ill.
J. M. Guthrie,	Quitman, Miss.
R. E. Shaw,	Bayou La Batre, Ala.
J. W. Scott,	Venice, Ill.
VanTelburg Hoffman,	Sumter, S. C.
Jay H. Durkee,	Jacksonville, Fla.
J. A. Williams,	Reidsville, N. C.
S. S. Royster,	Mooresboro, N. C.
D. P. Cannon,	Coaling, Ala.
E. M. Beasley,	Coal Creek, Tenn.
H. C. Crelley,	Vinegar Bend, Ala.
J. Howell Way,	Waynesville, N. C.
N. T. Underwood,	Russellville, Ala.
Geo. E. Davis,	Lawrenceburg, Ky.
J. R. Smith,	Selmer, Tenn.
G. W. Penn,	Humboldt, Tenn.
J. H. Martin,	Springville, Ala.
R. S. Young,	Concord, N. C.
G. W. Blanton,	Brunswick, Ga.
E. R. Michaux,	Greensboro, N. C.
D. E. Nelson,	Chattanooga, Tenn.
W. A. Dietrich,	Chattanooga, Tenn.
J. F. Arnold,	Limeston, Tenn.
T. A. Quattlebaum	Batesburg, S. C.
J. S. Moore,	Centreville, Ala.
C. Holtzclaw,	Chattanooga, Tenn.
R. M. Tillery,	Concord, Tenn.

Jas. S. Irvin,	Danville, Va.
J. M. Green,	Aberdeen, Miss.
G. S. Barksdale,	Fern Bank, Ala.
Jeff Davis,	Toccoa, Ga.
T. E. Prewitt,	Grand Junction, Tenn.
A. C. Hoss,	Jonesboro, Tenn.
Frank Blair,	Princeton, Ind.
W. W. Reynolds,	Meridian, Miss.
T. R. Trotter,	Winona, Miss.
Joel Crawford,	Yale, Va.
J. I. Odom,	Littleton, Ala.
W. E. Quin,	Fort Payne, Ala.
C. H. Raley,	Wrens, Ga.
S. L. Carson,	Lincoln City, Ind.
G. B. Thornton,	Memphis, Tenn.

The President next called for the report of the Special Committee appointed at the last meeting to request the Southern Railway Company to appoint a Chief Surgeon. There was no response and the President stated that he presumed the Committee had accomplished its work, as the Company had appointed a Chief Surgeon since the last meeting of the Association.

The Association then adjourned to meet at 2 P. M.

Afternoon Session—First Day.

The afternoon session was called to order at 2:30 by the President, Dr. W. W. Harper.

The reading of papers was taken up.

As Dr. W. P. Nicolson was compelled to leave the city that afternoon, his paper was called for.

Dr. W. P. Nicolson, of Atlanta, Ga., read a paper on "Employment of Celluloid Plates for Correcting Deficiencies of Skull, Operative or Accidental."

This paper was discussed by Drs. E. Denegre Martin, B. G. Copeland, S. G. C. Pinckney, C. P. Gordon, W. S. Wiatt, Geo. R. Dean and S. G. C. Pinckney (in closing for Dr. Nicolson).

Dr. W. C. Day, of Danville, Va., as Chairman of the Executive Committee, presented the following report:

The Executive Committee beg to report as follows on the subject of an official organ for the Association of Surgeons of Southern Railway:

First. That the International Journal of Surgery be selected as that organ in accordance with their proposition submitted May 2d, 1905.

Second. That the publishers of that journal shall recognize no member of this association as a subscriber until the treasurer of this association has furnished him the name and address and a check for the annual subscription of the member to whom the Journal is to be sent.

Third. That this association will not be responsible for the subscription price of a Journal sent to any member whose name and address and fee has not been supplied to the treasurer of this association.

Fourth. That all papers read before this association shall be recognized as the property of this association, and shall be delivered into the hands of the secretary for submission to the Committee on Publication.

Fifth. In the matter of letters of complaint from various members of the association touching their failure to their receiving the Journal and the differences which have arisen therefrom involving a somewhat lengthy correspondence between all the parties in interest, it would seem there is unlocatable fault somewhere. In view of this fact and the matters in contest being of small financial moment, it is respectfully advised by the committee that the treasurer of the association and the manager of the Journal close the matter by amicable correspondence.

Sixth. We nominate Charleston, S. C., as place of meeting in 1906, the first week in May.

W. C. DAY, M. D.,
Chairman Executive Committee.

Chattanooga, Tenn., May 2, 1905.

A Proposition from the International Journal of Surgery Co. to the Association of Surgeons of the Southern Railway Co.

A proposition is hereby submitted by the International Journal of Surgery to become the official organ of the Association of Surgeons of the Southern Railway.

The International Journal of Surgery Co. agrees to set aside sufficient space in the Department of Railway Surgery for the publication, within six months in its numbers of this Association's papers and transactions.

The International Journal of Surgery Co. also agrees to pay for a stenographer's services at the annual meeting.

The International Journal of Surgery Co. agrees to mail, prepaid, a cloth-bound book of transactions to every paid-up member of the Association, gratis.

In return for this service, the International Journal of Surgery Co. is to receive one dollar ($1.00) a year from the Treasurer for each member who has paid his dues, such member being then entitled to the Journal for one year.

We would call the attention of your members bers to the fact that the International Journal of Surgery is a strictly surgical publication, with an immense number of original articles on subjects of general surgery. Also to the fact that the Journal mails each month 28,000 copies. Abstracts of papers are not published in this Journal.

The Editor invites criticism of the Department of Railway Surgery by the members of your Association. He also asks your members to forward to him items and notices on topics of Railway Surgery of local interest to the members of your Association.

Respectfully submitted,
THE INTERNATIONAL JOURNAL OF SURGERY CO.
George Chaffee, M. D.,
Editor Dept. of Railway Surgery.

It was moved and seconded that the report of the Executive Committee be adopted.

Considerable discussion then followed, some favoring the adoption of the International Journal of Surgery and a few opposing it.

Dr. Miller moved, as a substitute for the motion, that the report of the Committee be adopted, except that part which referred to the Journals, and that action upon this be deferred until after the reading of papers at the evening session. This motion was lost.

After further discussion, the original motion to adopt the full report of the Committee was put and carried.

The International Journal of Surgery was therefore adopted as the official organ of the Association.

Dr. Thos. H. Hancock, as Chairman of the Grievance Committee, reported that the matters submitted to them would come under the jurisdiction of the Executive Committee, and turned them over to the Secretary.

Dr. Chaffee, of the International Journal of Surgery, was present, and stated that it was his desire to please every member of the Association, and that he invited the criticism of every member. On behalf of the Journal, he wished to thank them for their support in the past and the action taken to-day.

Dr. Hancock moved that as Dr. Chaffee was a railway surgeon he be extended the courtesies of the floor and invited to participate in the discussion. Carried.

The President announced that the election of officers would be taken up the first thing the next morning (Wednesday).

The reading of papers was resumed.

Dr. G. Pressley Neel, of Greenwood, S. C., read a paper on "Partial Intercapsular Fracture of the Femur."

Dr. H. T. A. Lemon, of Washington, D. C., presented a paper on "Fracture of the Lower Third of the Ulna."

Dr. J. H. Downey, of New Holland, Ga., read a paper on "Fractures of the Femur and Their Treatment with a Plaster-of-Paris Splint on a Double Inclined Plane."

The Chairman of the Program Committee announced that the paper of Chief Surgeon W. A. Applegate would be called for at 8 P. M. of this day instead of the following day.

The question of salary for the Secretary and Treasurer was brought up, and Dr. M. W. O'Brien moved that the Secretary be paid a salary of $100 per annum. This was unanimously carried.

The Association adjourned to meet at 8 P. M.

Night Session—First Day.

The meeting was called to order at 8 P. M. by the President, Dr. W. W. Harper.

Dr. Applegate invited the members of the Association to be present at a "Smoker" to be given the following night (Wednesday) at the Elks' Club.

The paper of Chief Surgeon Applegate was next called for.

Before reading his paper Dr. Applegate made a few remarks, stating that he desired to work in harmony with the surgeons of the Association and that he wished them to feel that he would be glad to hear from them regarding matters pertaining to their work. Dr. Applegate then read his paper, entitled, "The Relation of the Chief Surgeon to the Surgical Department," during which he exhibited the different appliances as described in his paper.

The paper was discussed by Drs. W. W. Owens, Geo. R. Dean, W. S. Wiatt, W. C. Day, M. W. O'Brien, R. J. Noble, R. S. Toombs, A. C. Hoss, Geo. Chaffee, and Dr. Applegate in reply.

Dr. W. K. Vance, of Bristol, Tenn., then read his paper entitled, "Some Suggestions to Our Chief Surgeon."

This was discussed by Drs. E. D. Martin, W. C. Day, G. E. Davis, Geo. Ross, W. C. Connally.

The meeting adjourned until 9 A. M. Wednesday.

Morning Session—Second Day.

The Association was called to order at 9 A. M. by the President, Dr. W. W. Harper.

Dr. Geo. R. Dean moved that the election of officers be postponed until all the members had arrived. Carried.

The reading of papers was taken up.

Dr. R. J. Noble, of Selma, N. C., presented his paper on "Fractures of the Skull."

Dr. J. H. Mitchell, of Mt. Vernon, Ill., read a paper on "Concussion of the Brain."

Dr. W. S. Wiatt, of East St. Louis, Ill., read a paper on "Head Injuries and Cases."

Dr. S. R. Miller, of Knoxville, Tenn., read a paper entitled "The Diagnosis and Prognosis of the Unconscious State in Cases of Injury."

The election of officers was then taken up.

Upon a call for nominations for President, Drs. W. A. Applegate, T. P. Satterwhite, and H. T. A. Lemon were nominated.

Dr. Applegate stated that he appreciated the nomination, but requested that his name be withdrawn. His request was complied with, and upon ballot Dr. Satterwhite received the majority of the votes cast, and, upon motion of Dr. Lemon, his election was made unanimous.

In thanking the members of the Association for the honor conferred, Dr. Satterwhite stated that this was one of the pleasantest occasions of his life. He stated that he had been a member of the Association since the first meeting in Atlanta, when Dr. Drake was the chief surgeon; that he had attended all the meetings except two, had presented a paper at every meeting at which he had been present, and that probably the members of the Association wanted to get him off the floor for one meeting at least. That he admired the action of Dr. Applegate in declining the nomination for President of the Association, and in doing so he had exhibited a trait that was exceedingly unusual and unselfish. This marked him as a high-toned honorable gentleman, and the officials of the Southern Railway had made no mistake in appointing him as Chief Surgeon, and that he predicted from this simple characteristic that he would be a lovable head of the department, and that the surgeons would all adore him. That he hoped all would be spared to meet again next year, and that there might be no vacant chairs, and that the Association would have as pleasant and agreeable a time as they had had in the past.

Dr. R. S. Toombs and Dr. J. H. Mitchell were nominated for the office of First Vice-president, and Dr. Mitchell, receiving the majority of votes cast, was declared elected.

Dr. R. J. Noble was elected Second Vice-president.

Dr. J. U. Ray was unanimously re-elected Secretary and treasurer.

Dr. Burdett moved that a vote of thanks be extended to Dr. Ray for his efficient service. Carried.

Dr. Day moved that the salary of $100 for services of Secretary and Treasurer date from the last meeting of the Association. Carried.

Dr. W. C. Day was re-elected to succeed himself as member of the Executive Committee.

The discussion of the papers read by Drs. Noble, Mitchell, Wiatt and Miller was next taken up, and these papers were discussed by Drs. M. W. O'Brien, B. G. Copeland, Geo. H. Moran, W. C. Day, W. C. Connally, W. M. Cunningham, J. M. Masters, T. E. Pruitt, A. C. Hoss, Thos. H. Hancocok, E. D. Martin, J. H. Mitchell and S. R. Miller (in closing).

Dr. E. D. Bondurant, of Mobile, Ala., read a paper on "Traumatic Neuroses of Hysteria Type," which was discussed by Drs. M. Campbell, S. G. C. Pinckney, A. C. Hoss, J. H. Mitchell and Dr. Bondurant (in closing).

On motion of Dr. Pinckney a vote of thanks was extended to Dr. Bondurant for his excellent paper.

Dr. B. G. Copeland, of Birmingham, Ala., presented a paper on "Angioma of Scalp: Cure by Hot Water Injection."

This paper was discussed by Drs. S. R. Miller, W. M. Cunningham, Geo. Chaffee, E. D. Martin and Dr. Copeland (in closing).

Dr. E. Denegre Martin, of New Orleans, La., read a paper entitled "Time and Indications for Amputation."

This was discussed by Drs. Manning, Thornton, Pruitt, Wiatt, McCoy, Copeland, Gordon and Dr. Martin (in closing).

The Association adjourned to meet again at 2 P. M.

Afternoon Session—Second Day.

The Association was called to order at 2 P. M. by the President, Dr. W. W. Harper.

The reading of papers was continued from the morning session.

Dr. J. M. Masters, of Newport, Tenn., delivered a talk upon "What the Railroads Should Demand of the Public for the Prevention of Tubercular Infection in Passenger Cars," which was discussed by Drs. W. C. Connally, S. G. C. Pinckney, B. B. Simms, R. L. Payne, W. K. Vance, Thornton, H. T. A. Lemon, and Dr. Masters (in closing).

Dr. Thos. H. Hancock, of Atlanta, Ga., read a paper on "Amputation of Leg."

This paper was discussed by Drs. Moors, Toombs, and Dr. Hancock (in closing).

Dr. G. B. Thornton, of Memphis, Tenn., presented a paper on "FirstAid to and Initial Report of the Injured in Railroad Cases."

This was discussed by Drs. Gordon, Toombs, Burdett, Simms, Pinckney, Pruitt, Connally, and Dr. Thornton (in closing).

Dr. M. W. O'Brien, of Alexandria, Va., read a paper entitled "Penetrating Wounds of the Eye-*Ball.*"

Dr. C. Williams, of Boston, Mass., delivered an address and exhibited apparatus and lantern for testing eyes.

Dr. M. F. Coomes, of Louisville, Ky., presented a paper on "First Aid to Injured Eye."

Dr. J. A. White, of Richmond, Va., read a paper on "Enucleation of Eye."

These papers were discussed by Drs. Burdett, Lemon, O'Brien, and Drs. Coomes, White, and Williams (in closing).

Dr. H. C. Crelly, of Vinegar Bend, Ala., read a paper on "Antisepsis in Railway Surgery," which was discussed by Drs. McCoy, Gordon, Dr. W. W. Harper, and Dr. Crelly (in closing).

The meeting adjourned until 7:30 P. M.

Second Day—Night Session.

The Association assembled at 7:30 and was called to order by the President, Dr. W. W. Harper.

Dr. C. I. Pegues, of Safford, Ala., presented a paper on "Sprains of Ankle," which was discussed by Drs. Dean, Miller, and Dr. Pegues (in closing).

Dr. Ambrose McCoy, of Jackson, Tenn., read a paper entitled "Burns and Their Treatment."

This paper was discussed by Drs. Satterwhite, Miller, Connally, Day, W. W. Reynolds, Payne, McFayden, Pinckney, Hancock, Johnson, Baldridge, C. P. Martin, McCoy.

Hon. Sanders McDaniel, Division Counsel, of Atlanta, Ga., read a paper entitled "The Relations of the Surgical and Legal Departments."

At the conclusion of this paper Dr. S. R. Miller introduced the following motion:

Mr. McDaniel's paper will not admit of discussion. Every word spoken is the gospel truth. If discussion were necessary we have no lawyers to discuss. I move that we extend a vote of thanks to Mr. McDaniel, and through him to the Legal Department, for his able paper, and his expression of interest in our department.

The motion was carried by a rising vote.

The Executive Committee reported that Charleston, S. C., had been selected as the next place of meeting.

The President announced that Dr. Satterwhite was compelled to leave for home that night and therefore the installation of President would take place at this time instead of the following day.

Dr. Satterwhite was then escorted to the chair and duly installed as President of the Association.

The meeting adjourned until 9 A. M. Thursday.

The Association assembled at 8:45 and was called to order by the President, Dr. W. W. Harper.

The paper of Dr. E. M. Magruder, of Charlotteville, Va., on "Treatment of Burns and Scalds," was read by title, in the absence of Dr. Magruder.

The following resolutions were introduced and adopted:

To Dr. W. A. Applegate we express our appreciation of his untiring efforts to render our meeting a success and our stay in Chattanooga a pleasant one.

Resolved, That the election of officers shall be at noon on the last day of the sessions.

Be it Resolved, That all resolutions, papers, and other business matters of the Association shall be referred to the Executive Committee, and that they shall not report on same until the last day, except on special or urgent business.

We herewith thank the Southern Railway for their kindness in furnishing transportation to us and our families.

Resolved, That a resolution of thanks be given to hotels and Pullman Car Company for special rates, to the Press for reporting our meetings, to the Mayor of Chattanooga, and the Chattanooga Medical Society for their hospitable reception.

Dr. Hancock moved that the Secretary be instructed to keep a list of the members of the Association, and in the future to mail notices to members only, and not to all surgeons of the Southern Railway.

Motion carried.

Dr. R. C. Smith, of Newport, Tenn., read a paper on "Shock and Its Treatment."

This paper was discussed by Drs. Thornton, Payne, Connally, Wiatt, Baxter.

Dr. R. L. Pane, of Norfolk, Va., presented a paper on "Secondary Closure of Abdominal Incision After Drainage: The Best Means of Preventing Hernia."

This was discussed by Drs. Miller, Baxter, Chaffee, and Dr. Payne (in closing).

Dr. Dunbar Roy, of Atlanta, read a paper entitled "Some Observation Upon Eye Injuries," which was discussed by Drs. Baldridge, Gordon, Ray, Harper and Dr. Roy (in closing).

Dr. C. P. Gordon, of Dalton, Ga., presented a paper entitled "Damage Suits Following Railway Injuries—Illustrative Cases."

Discussed by Drs. Connally, Baldwin, Ray, Mitchell, Moran, Cunningham, Harper, Applegate, and Dr. Gordon (in closing).

INSTALLATION OF OFFICERS.

This being the regular time for the installation of officers, the First Vice-president, Dr. J. H. Mitchell (in the absence of the President, Dr. Satterwhite) was conducted to the chair and duly installed.

In retiring, Dr. Harper thanked the members of the Association for their hearty co-operation in making the meeting a success, and asked the same support for his successor.

A rising vote of thanks was extended to Dr. Harper for his untiring efforts for the success of the Association, and fo his courteous manner of presiding over the sessions at Chattanooga.

The Association adjourned to meet in Charleston, S. C., May 22, 23, 24, 1906.

SIMPLE FRACTURES OF THE SHAFT OF THE ULNA.*

By H. T. A. Lemon, M.D., Washington, D. C.

Case 1. A brakeman, aged 26 years, was engaged in tightening up a brake, when the air was suddenly applied, the wheel slipped and his forearm was struck by the concave surface of the wheel. This occurred about 6 p. m. The man estimating his injury as a slight contusion continued on duty till 11 p. m., having finished his day's work, and then went to his home, thinking that he would be able to return to duty the next morning. At this time, however, his forearm was a little more painful and he called at my office. There was very little swelling and he had considerable strength in the grasp of his hand. I examined the wrist and in following up the ulna found a distinct fracture with anteroposterior displacement in the upper part of the lower third. The patient had no idea the bone was fractured, but was soon convinced of this condition by the presence of decided crepitus.

Case 2. A brakeman, aged 30 years, was struck by an engine and thrown across the track; he received no crushing injury, but sustained marked cerebral concussion and various contusions. His entire body was carefully examined for other injuries; no fracture of any kind was found. On the third day he could move his arms and legs with comparative ease, and soon after was able to sit up in bed and feed himself. I visited him daily. A week after his accident I called to see him while he was eating, and noticed that while he used his right hand remarkably well, he was a little awkward in the use of the left. Inquiring about this condition he said he had perfect use of the hand with the exception of a slight weakness. I again carefully examined the wrist, and following up the ulna and radius, found a distinct fracture of the former about 3 inches from the tip of the styloid process. There was absolutely no swelling. Absence of pain could possibly be accounted for by the mental condition. As stated before, there was only slight disability in the use of the hand and forearm, yet upon examination crepitus was readily elicited.

Scudder shows two cases in x-ray tracing, of simple fracture of the ulna, the only symptom in the first being localized pain, and in the second, pain and slight local swelling. While I would certainly desire more than these symptoms to confirm my opinion of fracture, I would be extremely suspicious. The anatomical relation of the ulna, though fractured, with the carpus allows much freedom of motion in the hand, and the uninjured radius acting as an internal splint often prevents or obscures most of the usual symptoms found in the fracture of a single bone. The superficial position of the ulna should ordinarily prevent the possibility of a fracture being overlooked, and such of course would be inexcusable if a thorough examination directed to that bone were made. I merely mention the above cases because we usually expect greater suffering on the part of the patient and greater apparent disability when a fracture is present; for these reasons we might not at first suspect the real condition, and thus fail to make as careful an examination as when the symptoms are more pronounced.

FRACTURES OF THE FEMUR AND THEIR TREATMENT WITH A PLASTER OF PARIS SPLINT ON A DOUBLED INCLINED PLANE.

By DR. J. H. DOWNEY, New Holland, Ga.

It is not my intention to bring before you any new fracture, symptom, diagnosis or treatment. But to present to you the time-honored plaster of Paris splint, with a slight difference in the technique of its application, which makes it an ideal splint for the various fractures of the femur, giving greatest comfort and best results to patients, and least care and worry to the physician. Fractures of the femur are by no means rare, they occur in the rural districts as well as towns and cities, and without respect to station in life. It makes little difference to the physician where it occurs or to whom the accident has happened. He who is called upon must realize that his task is not an easy one and his responsibility is great. Here Nature hides no great error. The grave only does, and that often after many years of conspicuous and successful advertising. Should the results be the best little will be said and few will know of it. But if marked deformity remains, as often does, its publication is limited only by the victim's means of travel and the censure of the physician is no less than the worst.

I will not speak of the etiology, symptoms or diagnosis and the classification only in reference to treatment. While all fractures of the femur should be put up on a double inclined plane, there are slight differences, which makes some classification necessary. For convenience I will treat them as fractures of the neck, upper, middle and lower third. Fractures of the neck occur usually in elderly persons and are often impacted, with little shortening, others without impaction, the displacement may or may not be great according to the location of the fracture and the nature of the force producing it and the length of time that has elapsed since the receipt of the injury. When satisfied we have to deal with an impacted fracture it is of utmost importance to use as little manipulation as possible. Our object being to firmly fix the fragments as they are without extension in the most comfortable position and by the method which will best meet our aims. This end is best attained by a double inclined plaster of Paris splint. To do this, patient lying on his back on a hard mattress, gently elevate the thigh to about forty-five degrees, allowing the leg to flex on the thigh until the heel reaches the same plane as the body, pad around ankle and knee, apply a smooth flannel roller bandage to level of perineum and the plaster is best applied in two sections, the first plaster roller being carried to within an inch below where flannel roller stopped, and each succeeding layer stopped one inch back from the preceding one; this is done in order to have a tapering upper end of lower section to weld the upper section to without leaving too great a ridge. Have a strong assistant to hold the limb steady, fold a comfort six or eight double, place under head and chest to twelfth dorsal vertebra, a thick book or suitable block under the injured hip, pad the perineum and bony prominences of the sacrum and cover with a flannel roller bandage beginning where you left off on lower section and carrying up to umbilicus, then begin with a plaster overlapping first plaster on lower section one inch, going well up against the perineum and around the upper part of the pelvis and abdomen to umbilicus, beginning with the second plaster roller where the outer or last one of the lower section stopped; go around the limb at this point with deep laps, then up as before, reinforcing as it is necessary over hip and inguinal region. The third plaster roller beginning about the middle of the thigh and carried up in the usual way.

In fractures without impaction more or less extension and counter extension is necessary. The application is made just the same as above described, only in this fracture it is necessary to thoroughly pad around ankle under knee and over perineum and allow the plaster to set firmly before traction is made, as we want to make traction on this section while we apply upper section, and wish to avoid any denting and making of uneven pressure on the parts. Now make your extension and counter extension until the fragments are brought into the desired position, hold firmly and apply upper section as described above.

Fractures of the upper and lower third I will speak of together, as they should be put up on the same plan, the only difference being the stopping point of the first section, which should always be a few inches before reaching site of fracture; this is done in order that the physician can have access to manipulate the fragments. In these fractures anesthetize your patient, flex the thigh on the abdomen sixty to sixty-five degrees, leg on thigh about the same angle, pad thoroughly around the ankle over popliteal space and gastrocnemius muscle, begin at the base of toes with roller bandage and carry it smoothly up to within two inches of the site of fracture and stop, apply the plaster in the usual way until you reach a point where, owing to the displaced fragments, the muscles are contracted and bulky and the limb is larger than it will be under the forced extension soon to be made; here the plaster must be applied sufficiently tight from this to stopping point, so that it will fit the parts accurately after extension is made. Wait a few minutes for plaster to set, the limb being held steady by an assistant, when sufficiently hard that the necessary extending force will not dent it. You are now ready to set the fracture; place one hand of the assistant under the knee, the other in front of the ankle; place a folded sheet or other suitable device against the perineum for counter extension. Now the first assistant makes extension until the fragments come into apposition and extension is steadily kept up. .

Examine upper end of lower section to see that it fits properly after extension. If you have failed in the estimated size, the matter is easily remedied. If too tight split plaster down to roller bandage and allow it to expand and fill in with plaster dough. If too loose cut a wedge shaped piece out through plaster and bandage and bring the edges evenly together until an accurate fit is secured. Pad the perineum and apply a roller bandage from stopping point on lower section to umbilicus and apply plaster as before directed, securely fixing the distance between head of tibia and perineum, so that it is impossible for shortening to occur. The hip and abdominal portion being made strong enough to prevent rotation or outward displacement.

Fractures of the middle third are put up on the same plan as the others, except that flexion is only carried to about forty-five degrees or to the point of most complete muscular relaxation, plaster being applied as previously described.

I began this method in 1898 and had put up three fractures of the shaft and one of the neck up to the visitation of our town on June 1, 1903, by a cyclone, when we had a number of cases all of which were treated by this method. Rfter the plaster had set they were allowed to move in any position that was most comfortable to them and after the twelfth day if their physical condition would permit they were required to either sit up in a reclining chair or be propped in a semi-sitting position in bed. The results in each case were satisfactory to both patient and myself.

(DISCUSSION OF PAPERS BY DRS. LEMON AND DOWNEY.)

DR. T. R. GARLINGTON, Rome, Ga.: I desire to make a report of two cases of fracture of the forearm and compound fracture of the humerus of the upper third.

In the first case a brakeman was riding on a car on a side track, the car going down an incline, where it struck a car of pig iron. The brakeman was thrown overboard and sustained a double fracture of the forearm and a compound fracture of the humerus. It was put up in plaster of Paris with a window at the sight of fracture, and he made perfect recovery with good bony union. The cast was taken off and replaced three weeks later.

The second case was a proprietor of a gin. While applying some gum to a belt that was slipping, his finger got caught and his arm was carried around by the pulley. He had a double fracture of the fore-arm and a compound fracture of the humerus. I treated it with coaptation splints and put in drainage, and so far it is doing nicely. Both cases are now doing well.

DR. W. C. DAY, of Danville, Va.: The only case of jaw fracture that I ever had was a fracture of the nasal superior maxillary and malar bones, also double fracture of the inferior maxillary, involving 5 incisor teeth. I wanted to wire the lower jaw but the patient would not permit it. An abscess of the antrum developed and this was drained by extracting a tooth and drilling into the cavity, and the man went on and made a good recovery. In these fractures of the lower maxillary, if the teeth are good, a wire splint is the most comfortable way to treat them. If you have complications and you have a good dentist you can turn it over to him and let him treat it. This case was the only one with which I have had any personal experience in fractures of the upper and lower maxillary bones.

DR. G. A. BAXTER, Chattanooga, Tenn.: Intercapsular fractures of the femur in my experience have been the most hopeless cases so far as the union of the bone is concerned. The reason for this is very apparent, not so much the age of the patient, for they are most frequent in the aged, but in the fact that we have had no control over the upper fragment. A temporizing course then seems to be the only course to pursue, with eventually a partial use of the limb. With any fracture, however, that involves the shaft of the bone, I believe that we have a right to expect good union and function. Old Dr. Sayre used to say that under the plaster treatment we got union without shortening and would measure the cases before the class. But in my experience I could not make my measurements come out as well as he did, and for a number of years I was sure that a fracture of the thigh meant shortening, but now I have changed my opinion.

I believe that we have two methods of treatment. One theoretically almost perfect, and that is Buck's extension; but it was under this treatment that for a number of years in every case I had more or less shortening. The second plan of treatment, the plaster of Paris received the same results from me, and I soon discarded this, believing that it would invariably give shortening. I attempted to get extension with counter-extension from the perineum, but I would have softening at the perineum and a shortening of the splint with a shortening of the limb. In the last two or three years, however, I accidentally ran across a plan that obviates this, and I can now report five successful cases of fracture of the upper part of the shaft of the femur without any shortening by the use of the plaster of Paris splint. Instead of running up against the perineum, the plaster is carried up around the waist and up and over the navel, and with the ribs you get counter extension by the breathing, and the result is perfect. At first I noticed that the plaster would break across the groin and outside of the thigh, and this would give partial destruction of extension and counter extension. This was remedied by interweaving a long splint from the knee to the navel. This splint was interwoven in the plaster from the navel across the groin down the thigh. I never apply cotton under the plaster of Paris. The swelling would decrease and you could place the hand along the inner side of the thigh, but the plaster extending to the foot would maintain the parts in perfect position. I believe the splint is an ideal one. It allows the patient to be moved around and you do not get any bed sores.

Fractures of the lower part of the femur do not necessitate any change in the old plan of treatment. Buck's extension is sufficient in these cases. But in fractures of the upper part of the femur I would urge upon you the modification of the principle by which we get counter extension from the chest and not from the perineum.

Dr. Thomas H. Hancock, of Atlanta, Ga.: I have seen a great many fractures of various types, but I have had only one case of fracture of the lower third of the ulna. This occurred in an elderly lady, who was standing in a car, which was struck by an engine, and she was thrown, striking her ulna across the back of a seat. The deformity was so slight that I did not have to give an anaesthetic to reduce it. I put it in a plaster-of-Paris cast, and the result was perfect. In most cases where there is any doubt that a fracture is present, you should give an anaesthetic to make a careful examination.

The plaster of Paris cast is the most comfortable dressing, unless it is the starch dressing, such as Dr. Copeland uses. This will hold the fracture in place, and they are the only comfortable splints that can be worn in these cases. You can not get a woody splint to conform to the shape of the arm, and you can not pad them so as to make them comfortable.

Dr. F. D. Kendall, of Columbia, S. C.: My experience with plaster of Paris has been rather unsatisfactory, especially with compound comminuted fractures. I have used De Puy's adjustable wire splint; also Lee's metallic splint. I prefer the latter, as it is easy to adjust and is light, strong and porous, and I have used them on a great many open wounds. You cannot get the plaster bandage off easily to dress the limb. I was sorry the doctor was not present to read his paper. I used these splints of wire and metal.

Dr. J. W. Oslin, of Gainesville, Ga.: I have been very much pleased with the report that Dr. Downey gave us. It was unique and original in one thing. That case I saw a few minutes after the double inclined plane was placed on the patient, and was very much impressed with the manner in which the patient was moved about. What attracted my attention most was the division of the splint into two sections. Is is something new to me and it occurs to me that a splint used in that way affords many advantages that I have never seen before. It also relieves the tension on the point of fracture.

Dr. M. W. O'Brien, of Alexandria, Va.: In regard to Dr. Lemon's case of fracture of the ulna, I should think it a very easy matter to dress these injuries. The point is that it is generally due to direct violence.

I had a case not long since that was due to an attempt to break a stick, and it flew up and struck the man on the arm. He, being a brakeman, made several trips with his arm in this condition. Upon examination I found the ulna broken about the middle.

I remember another case that was overlooked, which I saw a week after the accident, the man remaining at work not thinking a fracture existed.

The disturbance is so slight in these cases that unless the doctor is careful the fracture will be overlooked.

I prefer plaster of Paris as a dressing; indeed, any dressing with a position of rest will give a good result.

Dr. W. A. Applegate, Chattanooga, Tenn.: I have here an appliance that I use in putting on plaster of Paris splints. It is simply a stretcher, the frame of which is made of iron piping, with strips of canvas running from side to side to support the body.

In putting plaster of Paris about the thigh, I believe that we are responsible in the majority of cases for the shortening, because in applying the plaster of Paris splint you have to manipulate the limb, and in doing so you are bound to move the parts. You get the fracture reduced, and then in manipulating the limb the bones slip a little and sometimes displaced a good deal, and when you take off the plaster you are very much disappointed to find an inch of shortening.

With this appliance, if I have a fracture of the thigh high up, I put my patient under an anaesthetic and place him on this stretcher and run a strip under the arms and tie it to the upper end of the stretcher, and then tie the feet to the lower end. There is a little sagging at the middle, and so I put a broom handle padded with cotton to about the size of the fist under the body. You see that these cross strips are buckled on, and when applying the plaster, when you come to one that is in the way, you simply unbuckle it, and after you pass that point you buckle it again. With this appliance you can put the plaster high up around the body without moving it at all, and thus you will be sure to get perfect results. I have always wanted to know how to put plaster on and keep the parts in position.

I had a case that was thrown against a cross-tie, producing a double fracture of both legs and a fracture of the left thigh about the junction of the upper and middle thirds. He was a heavy man to handle, and I made this stretcher to put him on. I never changed the dressings, and I had first-class results. The man now goes about at work for the company.

In putting on the plaster, after using the absorbent cotton, I did not get good results, and I now use this glazed wadding or plain cotton batting, and tear this into bandages. I first apply a cotton stocking or put on underwear, and then apply this wadding over the stocking. Then when I put on my plaster it does not irritate the skin.

If you try this you will like it. I have put up eight fractured thighs in the last year and had good results with every one.

Dr. R. S. Toombs, Greenville, Miss.: The treatment that is universally adopted by Dr. Senn, of Chicago, is simply an adjustment of a couple of blocks and applied with strips. I had occasion twice during the last year to experiment with these. It is a simple method and one that gave satisfaction. There is no trouble, the patients do well, and I suggest it as a plan of treating these fractures.

Dr. B. G. Copeland, of Birmingham, Ala.: After the reduction is made in treating a fracture, the position of the fragments is easily fixed in the majority of cases, so it is just a question for the surgeon as to which splint he will use. What is a failure for one man may be just the thing for another. Plaster of Paris makes a good dressing, where the patient is under observation.

There are many forms of apparatus for applying the plaster. The one the doctor has exhibited aids you very much, not only in reducing, but in holding the reduction, and simplifies the application of the plaster. Dr. Hancock exhibited an apparatus before the association some time back which was really a very good one. I don't know whether he uses it now or not. I saw that and saw him use it on a case, and it seemed to be all right.

Now I can truthfully say that I cannot recall a single fractured thigh that has been under my treatment from the beginning that shows a limp in walking. I do not say that I did not get a certain amount of shortening, because I believe this is always present; but the compensation of the pelvis does not show any limp. But my experience has been that the nearer you approach the body the greater the danger of shortening.

As to Dr. Baxter's remarks, I want to ask him whether he got the idea from me or I from him, or we just had minds in the same channel; but I do not use cotton, and when I apply the plaster of Paris for fracture of the thigh I begin at the foot and stop at the axilla, cutting out the perineum, and do not allow it to touch here at all. I use strips of veneer to bind in with the plaster. I put this across in all directions, and the plaster will not break. I think the perineal pressure detracts from the usefulness of the splint.

Dr. Thos. H. Hancock, of Atlanta, Ga.: In the treatment of these fractures I have for a long time gotten almost perfect results, but in one case where the measurements seemed to be all right when the cast was removed, I saw the patient about six months afterwards and there was almost three inches shortening. I am satisfied in his case (where there was an oblique fracture) that although it was four or five months before he was allowed to walk, that the union was not complete.

At Mobile I exhibited before this association the apparatus devised by me which has a movable support for the hips. (See these photographs.) I am still using this. I also use Buck's extension in conjunction with the plaster of Paris, leaving the foot out, and applying the adhesive strips before I commence with the plaster. I carry the plaster almost up to the axilla. The higher up you carry it the better, as you will not then get any rotation of the limb. I use iron strips which are obtained from the trunk factories to reinforce the plaster. It is better than the wood strips, as you can mold them around the joints.

There is one point that has been omitted and which I believe to be important. I had two fractures of this kind at the same time, and did not take any precaution about their food, it being the custom at the hospital to keep such cases on liquid diet. They were both given liberal potions of sweet milk, and that night I had to cut the plaster casts on account of the abdominal distension.

In regard to fractures of the jaw, I think they are cases in which we need help. I had a man recently with a fracture of the lower jaw at the symphysis. I wired this man's teeth with small wire and about the second or third day they became so sore that it became almost unbearable. I took him to a dentist who made a plate inside the teeth and one outside, and wired these plates together at intervals. The man got instant relief and made a perfect recovery. These cases should be referred to the dentist.

Dr. C. P. Gordon, of Dalton, Ga.: I am a great advocate of plaster of Paris. When Dr. Sayre stated that fractures of the thigh could be treated without shortening he created a great deal of interest as other doctors were afraid they would be sued if they got shortening. I want to tell Dr. Hancock that it is not necessary to use much cotton under the plaster. I know what I am talking about, as I have been treating fractures for forty-five years. The first cases I ever treated were with the old splint and I got shortening. It is not necessary to bundle them up with a great big bandage to prevent the plaster from injuring the skin. All that is necessary is a neat lamb's wool bandage, and it is not necessary to put it around the perineum. After using the wool bandage, put on a neat plaster of Paris dressing, having a strong man to hold the foot steady in one position and you don't have to raise the leg up and down while you are doing it.

Dr. Thos. H. Hancock, of Atlanta, Ga.: The doctor misunderstood me. I did not say a great wad of cotton, as I use a thin layer. I always split the layer of cotton as it comes off the roll and make it very smooth and thin. I would not like to put the plaster on next to the skin, even if it did no harm to it or the circulation, as I would not know how to get it off without cutting the man.

Dr. G. W. Blanton, Brunswick, Ga.: I get better results from the flannel bandage unless contraindicated, which by its elasticity retains its position and supports the parts to which it is applied better than any other bandage.

I have an iron splint which I had made for the treatment of fractures of this kind, two and one-half inches wide and one-quarter of an inch thick, reaching from the waist line to six inches beyond the foot, with clips or cuffs at the knee and ankle and a circular steel band welded to the top of the splint fitting snugly around the waist line to six inches beyond the foot, with clips roller material attached to eyes at the junction of lateral and circular splints for counter-extension and a pulley weight for extension, while the distal end of the splint rests against the foot board of the bed; shortening is practically impossible.

I treated a man over sixty years of age who had lain on the frozen ground for twelve hours, this past winter, before being discovered, with a fracture of middle third with this splint without a particle of shortening.

In my hands Buck's extension causes the patient great discomfort. A description of the Hodgen splint may be found in Roswell Park's Surgery. I have recently used the Hodgen splint in the case of an old woman 75 years of age, who had a fracture of the neck of the femur, without shortening. One year prior to the time that she sustained the fracture she had a cerebral hemorrhage followed by a hemiplegia on the right side. She was very feeble at the time the fracture occurred and had not entirely recovered from the effects of the cerebral hemorrhage. The prognosis was grave and I warned the family of the possibility of hypostatic pneumonia, bed sores, etc. The patient experienced no discomfort from the use of the splint for five weeks, and within three months was able to walk about the house without a cane. As to the case reported by Dr. Lemon, I have seen a case recently in which the fracture occurred in the lower third of the radius. The injury was received four days before I saw the patient, but the patient did not discover that he had a broken arm until the morning I saw him. His attention was called to the fracture by the presence of a grating noise (as he called it), when he supinated or pronated his forearm. I think the periosteum remains intact in this class of fractures, and holds the fragments in apposition, preventing any displacement.

Dr. W. C. Day, Danville, Va.: I would like to ask the doctor if Hodgen's splint is not the same as the double inclined plane?

Dr. Wiatt: No. The Hodgen splint is a modification of the anteriôr suspension splint of Nathan R. Smith.

Dr. W. S. Wiatt, East St. Louis, Ill.: The fundamental principle involved in the rational treatment of any fracture consists in getting the fragments in end to end apposition and keeping them there. Most fractures involving the shaft of the femur or the neck of the femur, especially if the line of fracture be oblique, are accompanied by shortening. This shortening is due to the contraction of the hamstring and rectus muscles. Any treatment then which does not provide for the overcoming of this shortening is inefficient.

In order to overcome the shortening present we must tire out or overcome the spasm of the hamstring and rectus muscles which are causing it. Extension applied so as to produce the least discomfort to the patient, and at the same time effectually overcome the shortening is ideal treatment.

We believe the Hodgen splint is best designed to do this. It has a number of advantages. First, it is easy of application; second, theoretically and practically it produces continuous, equable and comfortable extension, at the same time keeping the fragments in end to end apposition by virtue of the lateral and posterior support it affords to the thigh at the point of fracture. As the muscles of the thigh atrophy the strips extending from side bar to side bar can be shortened so that the trough in which the limb lies continues to afford a proper lateral and posterior support. The splint is applicable to the treatment of fracture involving any part of the shaft or neck of the femur. The Hodgen splint is a much more comfortable apparatus for producing extension than Buck's. The rule in using Buck's extension is to apply a pound of weight for every year of age up to twenty.

Dr. S. R. Miller, of Knoxville, Tenn.: Dr. Lemon's paper is particularly interesting, as it warns us not to overlook fractures. We are, unfortunately for us, required to put ourselves on record at once, and if we do not record these fractures then we lay ourselves liable.

As to Dr. Hancock's apparatus for applying the plaster of Paris dressing, I have used it for several months and found it very satisfactory. I think I will try Dr. Applegate's and see which I like best. Both are good and I don't see how I can get along without one of them.

In regard to the dressing for the jaw, sometimes you will find it difficult to hold the jaw in perfect position. In one case I tried everything I could think of. I tried shrinking leather, and I tried rubber, but I found that by taking a four-tailed bandage and then applying a starch bandage over that I got the jaw fixed. I use the ordinary crinôline and after you get it thoroughly set you need have no fear of the patient moving his jaw after that.

Now, Dr. Baxter showed me his idea of putting up fractured femurs and since that time I have tried it and I don't think you will need anything else if you put that dressing on properly. I have tried all kinds of splints in order to see if I could find anything better, but if you know how to put on the plaster of Paris splint I think you will need no other splints in your office. However, I would be afraid to put the cast on as Dr. Baxter describes, that is, next to the skin. We must have something between it and the skin. I use the cotton batting oftentimes as Dr. Applegate has told us, but if you will use the ordinary cotton in place of the lamb's wool it will do just as well, that is, the cotton flannel. It makes an ideal bandage for this purpose.

I want to warn the man who has had no experience against putting on plaster without any padding around a joint where there is extensior injury. For this I use the raw cotton and not the absorbent cotton.

In putting on a dressing in cases like Dr. Lemon's, especially if you use the plaster of Paris splint, you should bear in mind that you want the bones separated and not overlapping. Get the natural position which will keep the bones separate, and when your plaster begins to set, if you will press in on both sides this will have a tendency to separate the bones.

I think the plaster of Paris dressing is ideal, and we always have it. Sometimes we have not splints enough, but we can apply the plaster of Paris almost anywhere. I have applied Dr. Baxter's method to the treatment of the shoulder as well, and it worked admirably. If your patients are unconscious or delirious and you cannot control them, and you have this ideal plaster cast, the position of the parts will not be affected by the movements of the patient.

Dr. C. P. Gordon, of Dalton, Ga.: How long do you wait to put on a cast?

Dr. Miller: I put it on as soon as I get everything ready.

Dr. E. Denegre Martin, of New Orleans, La.: In discussing this question, I want to corroborate every word Dr. Wiatt has said. In fractures of the femur I prefer Hodgen's splint to any in use, when its application is practicable.

It is well to divide these cases into three groups, infants, children and adults. Infants I find are best treated by suspending the leg; this is best accomplished by weight and pulley, applying just weight sufficient to keep the leg perpendicular. It seems to give them little discomfort and prevents the soiling of the dressing. In the treatment of children, I am not partial to the Hodgen splint; it is difficult to maintain traction unless the child in strapped to the head of the bed. On adults I use it always, and among these we have a class we must always keep in mind, the aged. We know the ill consequences of keeping these patients on their backs. The Hodgen splint allows of free motion and especially the sitting position. I think it well to give an anaesthetic in most cases, as the slightest manipulation often causes contraction of the muscles, not only producing pain, but frequently displacing the fragments. My results have been uniformly good and the comfort afforded the patient is to be considered.

The class of cases of fracture of the ulna, referred to by Dr. Lemon, are not of common occurrence and are apt to escape detection, from the fact that the radius acts as a brace and if there is no overlapping or displacement of the fractured ends, they will recover without detection. A light dressing of plaster of Paris or cardboard splint will suffice.

In reference to fractures of the jaw, I would like to call attention to a splint used by Dr. Matas, of New Orleans. It is a modification of the Kingsley splint. The inner and outer parts are held by a hinge attached in the center and made firm with a thumb-screw, which is tightened when the splint is adjusted.

DR. B. G. COPELAND, of Birmingham, Ala.: I want to refer to fractures of the jaw. The majority of us seem to forget that we get the best results in fractures of the jaw of any bone in the body. Nature does more to take care of the jaw than any other bone. In simple fractures of the symphysis, no treatment is necessary. The four-tailed splint is all that is necessary, and the fracture is often so slight that you cannot detect it. But where you get a double compound fracture you have something that is more difficult to treat than any other fracture in the body. In one case of this kind which I wired, infection could not be avoided, and it was a question for some time as to whether the parts were going to necrose, but I finally got good results: I had one compound fracture of the jaw with injury to the soft parts of the neck, and I wired this and you could never tell that a fracture ever existed except for the scar that was left. I agree with Dr. Hancock that it is a good thing to have a dentist to assist you in some cases, but we must remember that we get better results here as a rule than any other part of the body.

DR. W. C. DAY, of Danville, Va.: As to fracture of the thigh, I saw a case in 1888 of an old lady, 66 years of age, who got up in a train and was thrown against the corner of a seat, and I was uncertain whether it was an intracapsular or extracapsular fracture. I advised the company to pay her damages and let her go. I put her in the hospital and applied Buck's extension with sand bags, and much to our astonishment that old lady made a good recovery.

Dr. H. A. Royster, Raleigh, N. C.: It seems that Buck's extension is no good; that plaster is the very thing, and that Hodgen's splint is the sine qua non.

I have become a fatalist in regard to treating fractures. As a matter of truth the treatment of fractures is not a mathematical science, and after listening to this debate I am in the dark as to how I will treat my next fracture. The only course is to do the best you can under all circumstances.

As to the use of plaster of Paris, I would make one suggestion and that is that you make your cast off of the body and then apply it in the shape of a trough splint. If you do this you will have no trouble about getting your plaster off, and you will have no constriction of the limb. I have never had this method do anything but give proper results.

One speaker says to get the bones close together and keep them there. No fracture will unite unless you have a slight mobility between the ends of the bones, and the fact is, if you have too much immobility you will never get union, as the callous is produced by irritation.

Dr. W. C. Connally, Dallas, Ga.: As I listened to this discussion I was wondering if I had lived half a score of years in advance of this association. Eight years ago I presented a paper in which I covered the ground we have gone over to-day. It seems to be history repeating itself. We have present fifty per cent. new members who were not present then.

Dr. Royster has made a very good point, and that is the irritation of the ends of the bones.

Dr. R. S. Toombs, of Greenville, Miss.: We come together here from all directions. We come from the coal regions and iron mountains, and from the far South and from the East and the West. Truly the ramifications of the Southern Railway are almost interminable, but yet not measurable with the great, profound thoughts of its surgeons.

Much might have been said on this question about the plodding country doctor who takes his man with a fractured leg off of the train out in the country. He has no Hodgen's splint, and other appliances, which many of us have or can get conveniently. In the end we have to use our own practical judgment as to what is best. I find so many things that cause a wide variation in the treatment of ordinary fractures that no one rule can be established. All of the doctors who have spoken give many good points, but after all we have to use our individual gray matter to determine what is to be done. You have to study your case, exercise cool judgment, and make such applications as your genius dictates.

I have wondered that some of the gentlemen speak of putting on plaster casts without protecting the angles of the bones with padding. While I bow to my friend Dr. Baxter, yet I am opposed to applying plaster of Paris without protecting the prominences of bone.

Dr. H. T. A. Lemon, of Washington, D. C. (in closing): The object of my paper was simply to bring out the rarity of these cases, as I have found in my experience, and I have seen a great number of fractures. The two I have mentioned have been the only ones that I have seen, although I may have overlooked others. I said nothing about the treatment; and the text-books are very meagre in their statements upon the subject. The book by Dr. Estes I found the most practical for the treatment of fractures of the ulna. The treatment, however, was disposed of by Dr. Hancock and Dr. Miller.

Dr. Estes mentions a case of fracture of the ulna with displacement so far inward that he had difficulty to preserve the position of the bones and was finally compelled to wire the fragments to keep them in proper position. I can readily see that if badly displaced inward bony union of the ulna and radius might result with impaired usefulness.

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PARTIAL INTRACAPSULAR FRACTURE OF THE FEMUR—REPORT OF TWO CASES.*

By G. Pressley Neel, A. B., M. D.,
Greenwood, S. C.

George Eliot, in her "Mill on the Floss," uses this striking epigram: "Nature repairs her ravages." How often are we, as physicians, compelled to wonder at the completeness with which Nature does her reparative work! If her law is known, the chain of causes and effects, and if assistance is rendered and properly rendered only where Nature fails, complete restoration results.

Fracture of the femur constitutes more than 6 per cent. of all fractures. Fractures of the shaft about the middle third and about the neck occur most frequently; and of these, the fractures about the neck are most common.

The head of the femur is held in the acetabulum principally by means of the capsular ligament, a strong, dense, ligamentous capsule, embracing the margin of the acetabulum above and covering the whole of the neck of the femur, finding its lower attachments to the neck near the union with the shaft posteriorly, to the base of the neck above, and anteriorly to the intertrochanteric line on the shaft, thus opening the capsule in those fractures of the neck at the union of the neck and shaft—a partial intracapsular fracture.

In the aged, the strength of the femoral neck is lessened by senile osteoporosis. Occasionally this degeneration is so great that fracture of the neck results from very trivial violence, such as a sudden twist of the body, a trip, a misstep, or other slight force applied vertically by impact upon the foot or knee. It is questionable whether the fall with which the fracture is so often associated is not the result, rather than the cause, of the fracture. These changes in the bone are the reasons why in fracture in the aged it is so often found at the neck, and in the young at the union of the neck and shaft. Granting the necessary violence or force, a fall or blow upon the greater trochanter or side of the hip or thigh, and the weaker portion of the bone gives way, the weakest link in the chain breaks. In fracture of the neck, impaction is rare—frequent in fracture at the union.

In fracture within the capsule, union is impossible, except in those cases where impaction has resulted, or where strips of periosteum reinforced by fibres of the capsule still adhere to the fragments. Indeed, I doubt not that in all of those cases where the sufferer has attained the chloroform age of the novelist, as quoted by Osler, union had better be ignored, and the life of the patient considered. Of special interest here, perhaps, are the conditions found to exist in sixteen cases of fracture of the hip, treated in the Massachusetts General Hospital, many years after the accident. Patients were treated by gentle traction and immobilization for periods varying from a few weeks to a few months. Nearly all of these fractures were unimpacted, either primarily or secondarily. At the time of the accident, seven cases were between forty-two and forty-seven; the remainder, with two exceptions, whose ages are not given, were over fifty; three were over sixty. These cases reported for examination from two and one-half to twenty-four and one-half years after the accident. Thirteen of the sixteen had impairment of the functional usefulness of the leg; a weakness of the limb, necessitating a crutch in many instances; all movement of the hip somewhat restricted; atrophy of the muscles of the thigh, buttock, and calf of the leg; a decided limp, requiring a cane; pain in the hip extending down the thigh, even to the sole of the foot; pain at night in the hip; pain on going upstairs and stooping over. In only two cases of the sixteen could it be said that the leg was functionally useful.

In no case of fracture about the neck do I believe that any force or manipulative efforts should ever be indulged in beyond what the patient can readily endure without an anesthetic, on account of breaking up impaction or of tearing away the bands of periosteum upon which the upper fragment's vitality depends.

In the aged, I believe the indication for treatment to be to guard against the danger to life. Death so frequently occurs from shock, from local inflammatory changes, from bed sores—I have frequently seen a bed sore in from five to eight days—from hypostatic pneumonia. I had one case a short time ago in which a man in active life for his age, which was 65, died from the effects of a fall upon the shoulder where no fracture was sustained, and despite supportive treatment. The vital indications certainly demand that the patient's strength be not further taxed by dressings that cause pain, and by prolonged confinement to bed, if the ill effects become at all manifest. Special attention must be given to secure comfort, good nourishment, and to the avoidance of bed sores. In the vast majority of cases, good surgery demands the sacrifice of union of the part to the life of the patient. I have several patients leading comparatively comfortable lives by this course; whereas I believe death would have resulted under any other course.

In early life, good surgery demands the most complete immobilization, which I believe is best obtained by the plaster bandage. To sacrifice redundancy to clearness—it is only in the young that I would advocate this course. I believe that the age and vitality of the patient should determine the course of treatment, rather than the exact location and condition of fracture.

Case 1. D. G., aged 18, male, fell from a tree to the ground, a distance of 30 feet. He sustained a fracture of the shaft about the middle third of the femur, also a fracture of the neck at the union of the neck and shaft, a partial intracapsular fracture of the femur.

Buck's extension was placed on the leg, the fragments adjusted, and sand bags and weights used. Later it was found that coaptation was not maintained by this means, and four retention splints of soft pine were applied to the thigh, over towels so folded as to mold to the leg, and retained in place by means of zinc oxide adhesive plaster. The posterior retention splint was longer than the others, and extended from a point above the fracture of the shaft to below the knee. After six weeks the appliances were removed. On examination I found that I had excellent union of the fragments of the shaft, but no union of any kind of the fragments about the neck. A plaster bandage, extending from the foot to a point well up on the chest, was applied. Where the flexures of the body required, the bandage was reinforced by means of strips of tin, about half an inch wide, well embodied in the plaster. The plaster was cut away where it was likely to be soiled by the stools and well coated with shellac. The boy was told that he would have to remain in bed for two and a half months; but some time earlier, about the end of the sixth week, he cut himself out. It was found on examination that osseous union had resulted, with only three-quarters of an inch shortening. The function of the leg was entirely restored.

Case 2. John L., aged fourteen, fell from a moving train upon his side. He was seen by a physician in a neighboring town, who thought that he had reduced a dislocation. Fourteen days later, he was again summoned, when he referred the case to Dr. Harper and myself. When we saw the little fellow, his foot was inverted and the leg longer than the unaffected side. At first we thought that the injury was a dislocated hip. On more careful examination the lesion was readily found to be a fracture of the neck where it unites with the shaft of the femur. A plaster bandage was applied, as in the first case, and removed after a lapse of eight weeks. We saw the little negro ten weeks later, and made a very careful examination. The union was found to be osseous, and the function of the injured leg completely restored.

In conclusion I would emphasize the following points:

1. The relative infrequency of the fracture. In an experience of sixteen years, with 37 fractures of the femur, and a year of hospital experience where a large number of fractures were treated, I have seen this fracture but in two instances, and have noted but few reported cases.

2. The least manipulative efforts consistent with conclusive diagnosis—otherwise injury may result by destroying impaction or periosteal attachment, upon which osseous union depends.

3. Age and vitality of the injured is of more value in determining the line of treatment than the exact character and location of the fracture.

4. The beneficial effects of a well-fitted plaster cast, in those cases where vitality will permit its use.

SOME REMARKS ON HEAD INJURIES, WITH REPORT OF CASES.

By W. S. Wiatt, M.D., East St. Louis, Ill.

In the last five years the pendulum of opinion among our leading surgeons has swung several degrees toward the side of immediate surgical intervention in many cases of head injuries. The recognition of the importance of such intervention is our greatest surgical gain in this direction in recent years. It has been frequently observed that the slightest concussion accompanied by only momentary unconsciousness is followed by serious sequelæ, such as intracranial hemorrhage. The conservative treatment of such injuries often results in cerebral abscess, necrosis of brain tissue, epilepsy, intracranial hemorrhage, insanity, which conditions might have been avoided had proper surgical care been given the patient at the time of injury.

We report the following cases of head injury as they present some especial points of interest and show the necessity for immediate operative intervention, both for diagnostic purposes as well as rational treatment:

Case 1. Luther ——, colored, while engaged in a crap game was shot by a comrade. He saw him draw his revolver, and, anticipating the danger, threw his head downward and forward, turning the top of his skull toward the muzzle of the pistol. The bullet of 22-calibre entered the skull through the anterior fontanelle, passing a little to the left of the superior longitudinal sinus between the hemispheres of the brain, behind the corpus callosum, striking the inner surface of the occipital bone and being deflected at an angle so that it lodged in the substance of the medulla.

The accident occurred at 5 p. m. and the boy was able to walk to my office a block and a half distant. On arriving at the office I found that he was rational and could answer questions intelligibly. His pupils were widely dilated; he complained of nausea and was faint. The patient was immediately sent to the hospital, but the parents would not consent to any operative procedure until the following day at 11 a. m. Within an hour after the accident Cheyne-Stokes respiration began and gradually became more pronounced and well-defined until death the following day. At 10 a. m. a trephine opening was made, the trephine surrounding the bullet wound in the skull. With a Fluhrer's aluminum probe an effort was made to follow the bullet track to its end; but as the bullet had passed between the hemispheres of the brain it left no track, and no knowledge could be gained of its whereabouts with the probe. There was no hemorrhage, and the post-mortem revealed the presence of the bullet in the medulla. No wound of either hemisphere of the cerebrum nor of the corpus callosum could be found, but a depression of the dura on the inner surface of the occipital bone was thought by the physicians present to be the point at which the bullet struck and rebounded, lodging in the medulla.

This case is remarkable in that the superior longitudinal sinus was not wounded. It also illustrates the difficulty of locating a foreign body in the brain without the aid of the x-ray. We more frequently *search* for foreign bodies in the brain substance than we find them, and a skiagraph requires a long exposure and the patient is generally in no condition to undergo such an ordeal.

Case 2. A. G., blacksmith; had been seized with an epileptic fit while in a saloon. The patient was conscious when I arrived, and gave the following history: Twenty years prior to this date he had been struck on the head with a hammer, causing a depressed fracture of the skull at a point corresponding to the upper end of the fissure of Rolando on the left side. The epileptic paroxysms were general, and not of the Jacksonian variety, as would be expected from an injury in this locality. He was sent to the hospital and trephined over the point of depression. The removed button of bone was not returned and nothing was put in its place. The dura was opened and adhesions between it and the skull and the brain were carefully separated. No excision of the cortex was made, since the epilepsy was not Jacksonian. The dura was closed and the scalp wound sutured without drainage. The paroxysms did not recur for some weeks after the operation. The first one, appearing the ninth week, was described as being much less severe than those occurring before operation. At the end of the first year the patient said that the paroxysms were fewer in number than they had ever been before. During the second year he declared, when I tried to collect my bill, that the attacks were as severe and frequent as ever. The man was lost sight of at this time. This case is a good illustration of a bad result following the *conservative* treatment of a depressed fracture of the skull. It also substantiates the doctrine of Victor Horsly that general epilepsy following traumatism cannot be cured by relieving the pressure.

Case 3. B. S., aged eleven years, on September 1st, 1900, was carrying water to workmen on the Arcade building, when he fell from the first floor to the basement and struck his head on a sleeper. This happened at 5 p. m., and when I saw the patient, fifteen minutes later, he was able to answer questions, but was dazed and unable to tell how the accident occurred or where he was. The patient had the first epileptic seizure one hour after the accident, and a paroxysm about every half hour, lasting from three to five minutes until operated on at 8 p. m. He bit his tongue and frothed at the mouth during these paroxysms. At 8 p. m. a flap was dissected from the side of the scalp, the incision being entirely within the edge of the hair to avoid leaving a cicatrix in the forehead. A compound, comminuted, depressed fracture of the skull was found, extending from just in front of the ear up through the squamous portion of the temporal bone across the anterior inferior angle of the parietal bone, and through the frontal to a point corresponding to the edge of the hair. The detached piece of bone was driven into the substance of the brain cortex. There was overlapping of the comminuted fragments at the lower end of the fracture. Since the piece of bone was entirely isolated and great damage had been done to the pericranium, it was decided to be the wisest policy not to replace it, for fear of necrosis following. As the fracture was compound and we were not sure of the wound being absolutely aseptic, we thoroughly cleansed the parts, but did not fill the gap the bone had occupied with anything. The wound was closed without drainage and the patient made an uneventful recovery, leaving the hospital on September 8th, 1900.

Many surgeons advance the idea that if the gap in the skull is not filled by replacing the button of bone, or by sterile celluloid, gold-foil, etc., that adhesions take place between the dura and the brain and the scalp, and cause epilepsy or insanity later. Four years have elapsed since this injury took place and no symptoms have occurred.

Case 4. Charles S., laborer, on March 20th, 1899, fell 42 feet down the shaft of an elevator, the fall being caused by the breaking of a scaffold. Patient fell with the left arm against the left side, striking a 2 x 6 feet timber, 7 feet from the bottom of the elevator shaft, and then was thrown violently against the side of the shaft, hitting the side of his head. He was unconscious for a few minutes, and blind for one hour after the accident, but was able to hear voices during that time. There was considerable hemorrhage from the nose, mouth and ears. Deafness was almost complete for three months, and the patient has never been able to hear well with the left ear since the injury. The bleeding from the left ear continued for several days, the flow of blood alternating with a straw-colored fluid at times. On examination of the nose and ear with specula, no definite knowledge could be obtained, but the persistence of the hemorrhage followed by cerebrospinal fluid justified the diagnosis of fracture of base of the skull. The external auditory canal, nose, mouth and pharynx were antisepticized frequently, and the patient made a good recovery, the deafness in the left ear being the only unpleasant symptom remaining.

This case illustrates the difficulty in making a positive diagnosis of fractures at base of the skull, even though straw-colored fluid follow hemorrhage from the ear or nose. This fluid may be cerebrospinal, but only a chemical analysis will differentiate it from blood serum, the liquor Cotunnii, or the fluid from the mastoid cells.

Case 5. Raleigh ——, aged 14, on January 9th, 1902, while trying to jump on a moving coal car, missed his footing, and in falling struck his occiput on the corner of the granite sidewalk. Patient was unconscious for fifteen minutes, and when I arrived one-half hour after the accident he was still dazed, with widely dilated pupils, talked incoherently and could give no history of the injury. The boy was immediately sent to the hospital, and on dissecting down a flap, an incomplete depressed fracture was found a little above and to the left of the external occipital protuberance.

The fragment of bone on one side was depressed, so that its outer surface was on a level with the inner surface of the skull. It was removed and the scalp wound closed without drainage. The boy made an uneventful recovery, and has had no unpleasant sequelæ.

This case is unique, on account of the proximity of the depressed fracture to the center for sight in the occipital lobe. If this fracture had been treated expectantly, the patient in all probability would have had hemi-anopsia or half-blindness in the opposite half of both retinæ.

Case 6. I. S., aged thirty-five, on September 23, 1904, while crossing a street car track was struck by a car. He turned a somersault, alighting on his occiput. He was rational one hour after the injury, and able to recognize friends two days after its occurrence. He then became delirious and remained so until his death. On the morning of the 26th, Dr. Applewhite, his physician, and myself decided to raise a scalp flap and inspect the skull under the site of contusion. We found no fracture of the skull, and as no pressure symptoms were present justifying the opinion that a motor area was involved, we investigated no farther. The patient died on the morning of the 27th, and the post-mortem revealed the following lesions: A contusion over the left occipital lobe involving an oblong area, possibly two inches in its longest diameter. Ecchymoses over the entire area were present. In the parietal lobe of the opposite hemisphere two lacerations were found, the brain substance in and around these lacerations being necrotic. This patient was addicted to the use of alcohol and told me several times within the last few years that he averaged taking fifteen drinks of whiskey per day. With lacerations in this part of the cerebral cortex we would expect some involvement of the motor areas along the fissure of Rolando. No symptoms indicating such involvement were, however, present, the patient using his left arm and leg as well as his right.

This case substantiates the observation of Keen, that a contusion or concussion of any severity is accompanied by laceration of brain tissue. It also illustrates the difficulty in differentiating between coma or delirium due to head injury and coma or delirium due to alcoholism. This case was diagnosed by a good surgeon as one of delirium tremens, he expressing the opinion that the injury was not much concerned in the production of the delirium.

Case 7. This case is not reported as one in which a positive diagnosis of head injury, followed by cerebral abscess, was made. There was possibly no relation existing between the injury and the brain compression, but the history is worthy of study. In August, 1904, the patient, a child, fell down the stairs, striking the right side of the forehead just above the eye against the edge of a step. The child was drowsy for two or three hours afterwards, and then resumed its play. Two weeks after the injury, the right ear began to suppurate, the discharge continuing for a few days and then stopping for some days up to the time of the final illness. There was no history of scarlet fever or any of the exanthemata within the last year. During the period that the ear was not discharging the child had fever, was flighty at times and very excitable, easily losing its power of self-control. As soon as the discharge was re-established, these symptoms would disappear. On October 28th, the patient became unconscious. Temperature normal; pulse ranging from 60 to 70; respiration labored; right pupil dilated and fixed; right eyeball bulging; constant movement of the left leg, foot and toes; some movement in the left arm and hand, but not so much as in the foot. A diagnosis of possible cerebral abscess was made, which was confirmed by the consulting surgeon, and it was decided to trephine over the upper end of the fissure of Rolando, as symptoms in the left leg and foot pointed to this as the area involved. When the button of bone was removed the dura bulged into the opening; when the dura was opened the brain bulged. The brain was probed in different directions with a grooved director, but no pus was found. The brain tissue was necrotic or disintegrated to such an extent that a grooved director was carried by its own weight through it. Immediately on incising the dura and relieving the compression, the child's pulse and respiration became better. An opening was also made in the mastoid region, no pus being found in this locality. A post-mortem could not be held. If it had been, I believe it would have revealed the presence of an abscess somewhere in the brain substance, possibly in the cerebellum. The child began having Cheyne-Stokes respiration a few hours after the operation and continued to have it up to the time of death.

This case, as well as Case 1, substantiates the belief of Horsly, Nicoll and others that lesions of the central nervous system produce death by paralysis of the respiratory center rather than by paralysis of the cardiac center. Horsly and Nicoll both report cases in which the breathing stopped as soon as anesthesia was begun, artificial respiration being kept up as long as an hour without any effort on the part of the patient to breathe spontaneously. The operators became desperate, opened the skull, and immediately the patient breathed.

Some improvements have been made in the surgical technics of brain surgery in recent years. Keen, in exposing large areas of brain cortex, makes trephine openings, passes a probe from one opening to the other between the dura and the skull, threads the end of the probe with a piece of silk and pulls a Gigli saw through from one trephine opening to the other. In sawing through the skull he bevels the edges of the bone so that the fragment will not become depressed or slip down on the brain cortex when it is replaced.

The application of a pneumatic rubber tourniquet, as suggested by Cushing, just above the ears makes operations on the scalp practically bloodless. The tourniquet must be inflated with air, else pressure neuritis may follow its use.

As to closing the opening in the skull with the fragment of bone removed, or with celluloid, gold-foil, or silver plate, there is much difference of opinion among surgeons. Some contend that either of the three substances named acts as a foreign body and causes sepsis; others that if the fragment of bone be replaced, necrosis and septic infection frequently follow, and that if some substance is not used to separate the brain and dura from the scalp to prevent adhesions between them, these will inevitably take place and cause troublesome sequelæ.

SUMMARY.

First. All cases of head injury, no matter how slight, are liable to be followed by intracranial hemorrhage, as much as 36 days having been known to elapse between the time of injury and the formation of a clot large enough to produce marked symptoms of compression.

Second. Any case of severe concussion is liable to be accompanied by laceration of brain substance and cerebral hemorrhage.

Third. Immediate surgical intervention, if there is compression, is the only means in most instances of getting a clear conception of the conditions present and of remedying them.

Fourth. Since lesions of the central nervous system produce death by respiratory, rather than cardiac, paralysis, an anesthetic is to be given cautiously in any case of brain compression. Most cases of compression can be operated on after dissecting the scalp flap without anesthesia, since the skull, dura and brain are insensible to pain.

Fifth. Rigid asepsis is essential to success and the prevention of unpleasant sequelæ in the surgical treatment of any case of head injury.

THE DIAGNOSIS AND PROGNOSIS OF THE UNCONSCIOUS STATE IN CASES OF INJURY.*

By S. R. MILLER, M.D., Knoxville, Tenn.

The unconscious state alarms the layman and often perplexes the surgeon as few other serious conditions do. This is particularly true when associated with injury.

Anxious friends or employers expect of the surgeon an opinion as to the cause and seriousness of the case, but he, though of most extensive experience, is often unable to determine the exact nature or extent of injuries of such character.

It is not the purpose of this short paper to advance any new thoughts on this subject, but merely to recall important symptoms, that we, as railroad surgeons, may be more familiar with them and may more easily recognize and group those of most important character. This class of cases often involves important medico-legal questions, and the burden of proof rests almost entirely upon the surgeon. Justice between the patient and corporation can be obtained only by his close observation and knowledge of the case.

Every case of unconsciousness is not necessarily due to injury, even though the latter be present. Acute alcoholism may be the cause and the injury be only coincident. Likewise, narcotic drugs, apoplexy, epilepsy, vertigo and heatstroke are common causes, and pernicious malarial poison, renal disturbance and intracranial inflammation are occasional causes of unconsciousness and may give rise to injury. In such cases the injury is only a complication and not the cause of the unconsciousness.

In the cases enumerated above there is frequently a history of certain prodromata and possibly of previous attacks. Such would easily establish the true cause, but in many cases no history is obtainable until the patient regains consciousness or, possibly, until recovery.

The odor of alcohol is of little value of itself in diagnosing a case of unconsciousness, but it is a well-known fact that an individual drinking freely, or even moderately, is more liable to accident than the total abstainer. Alcohol may be administered after injury, and, if given freely, may be the cause of unconsciousness, and the injury may be of minor importance. Again, free drinking may be followed by injury to the head and later by profound alcoholism of serious character. Without a history in such cases, it is often difficult to make a positive diagnosis or probable prognosis.

Much that has been said of alcohol may be said of narcotic drugs. The effect of knock-out drops is well known to those in the large cities and not infrequently is associated with injury. Morphin is frequently and sometimes unwisely administered for injury. The writer recalls a case in which the first physician called administered two doses *per os*. The case came under the care of another physician, who without any knowledge of the former treatment, administered one or two doses of morphin hypodermatically while the first two were probably in the stomach. When the case came under my care it was under the profound influence of the drug, and though seriously injured, the patient probably died of the effect of morphin.

Apoplexy, epilepsy, and vertigo are each responsible for many falls, and occasionally falls from heights or from running trains. The former may be associated with acute alcoholism. The pathology of apoplexy and some head injuries is such as to render a differential diagnosis impossible. Heat-stroke is probably responsible for more falls resulting in head injuries than are so accredited.

If, then, these conditions are often serious in character and are productive of or associated with injury, how may they be recognized? What are the points of distinction? The responsibility of the case and of a correct diagnosis rests upon the surgeon. The statements of those who witnessed the accident, or first saw the patient after the alleged injury, should be carefully weighed but not accepted without careful consideration. The layman takes much for granted, and he considers but little in the investigation of cause.

Shock, internal hemorrhage, and injuries to the cerebrospinal centers present varied symptoms, and but few, if any, can be considered characteristic. Experience, close observation, and the recognition of each symptom as related to others, are the only means of correct diagnosis.

Opium poisoning presents contracted but equal pupils except for a short period immediately preceding death. The respiration is slow, shallow and sometimes stertorous. The skin is cool and clammy. The pulse is slow and the temperature is subnormal. The reflexes are abolished and death occurs from paralysis of the respiratory centers.

Acute alcoholism usually presents normal or dilated pupils of equal size. The respiration is almost normal in frequency and is rarely stertorous. The skin is hot at first, but soon becomes cool and often clammy. At first the pulse is full and strong, but it becomes weak and rapid. The temperature is subnormal. The reflexes and consciousness are partially or completely abolished. Death is caused by paralysis of the heart or respiratory centers.

Apoplexy presents unequal pupils, normal or dilated in size, except when the lesion is in the pons, when the pupils are contracted and usually of equal size. The respiration is stertorous and irregular, and the pulse is strong and usually slow. The temperature is elevated. Unconsciousness is usually complete, and paraplegia is present.

Epilepsy presents symptoms more transient in character, but there is occasionally prolonged stupor which may be mistaken for incomplete unconsciousness. The tongue is not always injured in epileptic attacks and, though it may be injured by a fall from other causes, a wound of the tongue by the teeth is strong presumptive evidence of epilepsy, and is perhaps the most important symptom remaining after the seizure has passed off.

The diagnosis of unconsciousness due to pernicious malarial infection is impossible without the history of exposure, prodroma, a temperature chart or blood examination.

Likewise uremic and diabetic comas are difficult to recognize without any history of the case or a prolonged observation of the same. In both, a symptom rarely observed in other conditions of unconsciousness is a very low temperature, even as low as 90 degrees F. In diabetes there is usually the sweetish odor to the breath and in uremia there may be the ammoniacal odor from the skin or clothing. The examination of the urine in either case should clear the diagnosis, but in uremia may not be conclusive.

Electric shock not infrequently causes serious or fatal falls. In such cases external wounds may be of a character that would produce similar symptoms and yet be only a complication of the electric shock. Fortunately in such injuries there is evidence of electric burns.

There is a difference of opinion among surgeons as to the possibility of a differential diagnosis between shock and hemorrhage. Only in the most serious types do either of these cause unconsciousness. They may often resemble incomplete unconsciousness. If the patient has bled to syncope, the appearance of the acute anemia, the absence of radial pulse and external evidence of blood should fix the diagnosis. In shock the diagnosis is more difficult. Even though there is sufficient external evidence of injury, it must be remembered that in acute alcoholism extensive injury to vital parts may be endured with insignificant shock. In shock the skin, the temperature, the pulse and the pupils may be the same as in acute alcoholism, but the respiration is usually shallow, irregular and of sighing character, in contradistinction to the more regular and deeper respiration in alcoholism. Nystagmus of greater or less degree is almost always present in shock and rarely, if ever, in alcoholism.

The symptoms of so-called concussion are so varied that this short paper will not admit of their full consideration. Petit, Littre, and many German authorities believe there is a disturbance of the equilibrium due to oscillation of the brain substance, thereby producing molecular changes. Duret and the French authorities contend that it is the sudden change produced upon the vascular portion of the brain and the fluid in the ventricles. English and American surgeons claim that there is a distinct anatomical lesion in the brain tissue or membranes and that it does not differ from a contusion or laceration. Likewise we may include, in this connection, compression because of its close association with concussion and contusion. If the case is of such severity as to cause complete unconsciousness the symptoms may be identical with those of shock.

In compression of the brain there is usually paraplegia if due to blood clot, and if due to fracture there is commonly some evidence of irritation as well as compression. Convulsions are not infrequent when certain portions of the brain are involved. Contusion, if not so severe as to totally destroy the injured structure, also often produces symptoms of irritation. If concussion, contusion and compression are not the primary cause, they often overshadow and are of greater importance than the original trouble of which they are directly or indirectly the result.

Vertigo is not often of such character as to excite alarm or serious result. It may cause a fall that results in severe and complicated wounds. If these terminate fatally without a return of consciousness a positive diagnosis will be impossible. If, however, after regaining consciousness the patient is of the opinion that he was struck, and remembers falling or trying to shield himself after the injury was inflicted, it may be determined with assurance that the primary cause was probably vertigo and the wound a secondary matter. If a blow is the cause it produces immediate unconsciousness, if at all, except when the effect is indirect. Indirect unconsciousness may result from vertigo, nausea or secondary injury following a blow which stuns, but not from such injury as causes total unconsciousness.

In conclusion I wish to say that each case must be a law unto itself. Every symptom, every part of the history, every feature of the surroundings should be weighed carefully and in connection with each other and accepted only for what they are worth. Nothing should be assumed until all means have been exhausted, and thus we render the patient the best service possible and bring most credit to ourselves and to our profession.

CONCUSSION OF THE BRAIN.*

By J. H. Mitchell, A.M., M. D., Mt. Vernon, Ill.

When Solomon said "There is no new thing under the Sun," it is in evidence that he was not acquainted with the numerous and interesting relations this hydra-headed monster—concussion of the brain—would bear toward railway companies and surgeons. The meaning of the word itself is sufficient to cause one to tremble with fear. *Con* and *quatere*, to shake up or shake together, the shaking up of one organ from violence to another.

The diagnosis of concussion of the brain and spinal cord is very easy to the damage suit attorney, the blackmailer who makes a business of fleecing corporations and physicians, and even to many persons who are the tools of these sharks. You who have been connected with railway companies as surgeons for any considerable length of time, especially in railroad centers, know this to be the case.

A person, frequently a woman, and I blush when I make the assertion, will be in the act of placing a hat, a band-box, possibly a small bundle (it is not always easy to guess reliably as to its contents) when the train starts ever so slowly, she will sit down suddenly, either on the seat or in the aisle, and there follows a case of concussion of the brain that is worth thousands of dollars. Surgeons experience much difficulty in diagnosing these cases. We cannot see quite so clearly the extent of the solution of continuity, hence we must necessarily be very careful in arriving at a diagnosis; as we are aware that to make a diagnosis of concussion of the brain or of the spinal cord in the case of railway accidents is equivalent to flaunting the historic "red rag" in the face of a bull. We render the condition of our patient incurable until his injuries are anointed with a money equivalent, equal in value to the size of his or her perverted imagination.

We often find that the individual who is of the least value to the community in which he exists, and whose injury is the least, is the most troublesome to treat and the one who is the higher priced when it comes to his estimate of the value of his injury.

We are aware that concussion is a condition that when severe causes a certain train of symptoms—not always constant, however—viz: complete loss of the functions of the brain without any appreciable organic lesion, instant loss of sensation and volition, and vomiting.

The writer has observed in certain cases a peculiar character of the expulsion of the contents of the stomach. After the patient had lain quiet for a short time, there would occur a few restless movements and then a great quantity of dark-colored liquid was ejected, as though thrown from a vessel under great pressure, a number of feet, and these actions occurred at regular intervals. During the intervals between the attacks of vomiting the patient would remain quiet as in sound sleep, the breathing was not stertorous, the pulse was variable, generally rapid and feeble, the extremities cold, every evidence of profound shock.

Pathology. We cannot determine the pathology with any degree of exactness nor can we determine the extent of the lesion, and the location thereof is equally obscure. Albert, after numerous experiments, concludes that concussion produces an irritation of the vagus, causing a dilatation of the central bloodvessels.

Treatment. As to the treatment of concussion of the brain, the writer will not undertake to give you any stereotyped system, as the condition and surroundings of the patient must necessarily determine this in some measure. The following cases will in a measure be pertinent to this paper.

Case 1. B. H., aged about 25 years, brakeman, while sitting asleep either on or near the track, was struck by a moving train and thrown some distance from the track. When found he was lying unconscious and apparently totally paralyzed. Dr. H. L. Gee, surgeon for the company, was called to him and the writer was soon on the scene as consultant. We removed the patient to a hospital, where we found him suffering from a severe concussion.

There was bleeding from the mouth, nose, and ears; the breathing was regular but slow; the odor of the breath very offensive—that of putrid flesh; the pulse rapid and small; the extremities cold; an entire absence of volition and sensation; the urine voided unconsciously; the patient was as a piece of wax, not even an eyelid moved.

The only evidence of external violence was a contused and slightly abraded spot on the left side of the head, above and in front of the ear. The patient remained in this state a number of days before he could swallow even liquids. He continued in a state of total paralysis 17 days. When he was first noticed to move any member of his body it was to lift the right leg—the side opposite to that of the visible injury. During a number of days following he became very restless and delirious, making it necessary to control him by strapping him to his bed. This condition continued for several days, the temperature being usually subnormal, when the patient became quiet and began to recognize his surroundings. He did not, however, ever become able to recall any incident connected with the receipt of the injury. He improved gradually but slowly for 43 days when he went away from the hospital and city. At the time of his departure from the hospital he was able to walk with the assistance of another person, was also able to control the movements of the upper extremities, and regained control of the action of the bowels and bladder. His general condition was such as would lead to the expectation of a complete recovery—especially if he is successful in a great law suit which the writer has been informed he has entered into against the railway company.

Case 2. J. T. M., aged about 45 years, brakeman, while sitting asleep on the end of a cross tie was struck on the right side of the head by the step of the engine of a moving passenger train. The accident occurred at Dix, Ill., nine miles from Mount Vernon, where the patient was first attended by Dr. Clark. He was then put on a train and brought to Mount Vernon and placed in hospital. Upon examination the writer found a depressed fracture of the skull. The fracture was crescentic in shape and about three inches in length, above the right ear. A depressed portion of the bone was driven down into the dura; the outer table of the fragment was driven beneath the inner table, producing great pressure on the brain. The condition of this patient was critical; pulse small and rapid; breathing slow and regular, though not stertorous; odor of breath very offensive—the scent cadaverous—and extremities cold.

The concussion extended to the opposite side of the head—*contre coup*—the patient could move the left arm and leg, which he did occasionally, but the right side was totally paralyzed. He did not at any time move either arm or leg of this side, and when placed in any position by another they remained as placed.

After trephining the skull and raising the depressed portion to its normal position, removing at the same time small spiculæ of bone which had been driven through the dura, the patient reacted until the surface and extremities became warm, but the paralysis continued until death, 24 hours later.

Consciousness did not return, but about twelve hours after the operation the patient became able to swallow liquids, with difficulty, however, for about two hours. Strychnia, morphia and atropia were given hypodermically every two or three hours as indicated by any evidence of failure of the heart's action. The nerve centers would respond to some extent upon every administration of the stimuli until about five hours before death, when the breathing became stertorous and mucus began to collect in the throat. The contents of the bowel and bladder were voided apparently without the knowledge of the patient.

The above cases were both very peculiar. The first case on account of the extent of the paralysis and the length of time it continued, and then the recovery. The second in that the paralysis was of one side, and that the side of the depression of the skull at the site of the visible injury. It is clear that the concussion extended to the opposite side of the brain, affecting the centers of motion. These two cases are especially interesting in that they prove in some degree the difficulty of diagnosing the exact location and extent of the trauma that produced the accompanying symptoms. In Case 1 movement was first observed in the limb opposite the side of the visible injury. In Case 2 the limbs were paralyzed on the same side as that of the visible injury.

These cases are also interesting from a medicolegal standpoint, as the writer has been informed that attorney for the wife of Case 2 has filed suit for large damages against the railway company. It will be a somewhat delicate point to establish the precise nature and extent of the lesion that must cause the conditions that followed.

While this paper may not have thrown much light on the subject named, it has been a cause of thought and investigation by the writer, as few more apparent conditions can.

FRACTURES OF SKULL.

DR. R. J. NOBLE, SELMA, N. C.

This short paper is only the report of a case I had some five years ago. Jim Whiley, a negro boy, eighteen years of age, was brought to my office about six o'clock in the evening unconscious, with the following history: The night before he, with several other negroes, visited an illicit whiskey distillery and, after drinking as much as they wanted, started home. As they were pretty full they built a fire, and while sitting around the fire a quarrel arose. One of them picked up a pine limb and struck Jim over the head with it, knocking him senseless. No one seemed to care about Jim's condition, so he lay where he fell for an hour or so. Then they tried to get him up, but they could not, so they stayed with him the rest of the night and all day. He was then put in a wagon and brought to my office, some six miles.

I had him carried to his home, about one mile away, and I believe it to be the most filthy place I was ever in. There was not a dish in the house in which to put an antiseptic solution; no cooking utensils except a frying pan. My assistants were two cornfield negroes, my operating table the dirty straw bed laying on the floor. I used the frying pan to boil the water. My general surroundings were such that the city surgeon with his white gown and cap, his trained nurses and spotless dishes, would almost have fainted, but kneeling on the floor I gave him an anasthetic, and when anesthetized I turned it over to my negro assistant and began work.

On the left side of his head, above his eye, in the edge of the hair, there was a little swelling, so I shaved his head and after thoroughly scouring it I made an incision about four inches long down to the skull, but found no depression. While making an examination my finger found a soft place and I found I had missed the wound the fraction of an inch. I then made an incision at right angles to the first one, which put the wound in full view. I found the soft parts under the skin lacerated and as if cut with a knife. There was no external wound. Carefully examining it I found a depressed fracture, which I tried to lift up, but could not. I then trephined and easily lifted the broken pieces of skull. I noticed that the bone was clear of periostem and clean. After removing the pieces of bone I removed the clot, which was at least one and a quarter inches thick, and washed out the depression in the brain. The brain had been compressed so long, 23 hours, that it resembled the depression in link sausage. The dura-mater was torn and the clot was beneath it.

The wound was then sutured and dressed with iodoform gauze. This was about 8 P. M. I left soon after, but the patient was unconscious, and remained so until about 6 the next morning. He then seemed restless and uneasy, but was paralyzed except his left arm and hand. His father put him in a chair before the fire, where he sat quietly for some hours, conscious, but unable to speak or move except his left hand and arm. They had tried to feed him, but he could not chew or swallow. I saw him at 9 A. M. and found his condition as above stated. That afternoon at 4 o'clock I saw him again and he was in about the same condition. The next day about 12 o'clock he swallowed some coffee and soon after some milk. He remained in that condition for four days. He had no control of his bowels or bladder for the first two days; but, after that, he managed to make his wants known by motions and grunts. On the fifth day he regained the use of his left leg and foot. By the sixth day he could stand, having recovered the use of his right arm and leg; in fact, the paralysis was all gone except as to speech, and on the seventh day, when I went to see him, he had walked over to his sister's house, some one hundred and fifty yards. I did not remove the dressing until the tenth day, and then found that there had been union by first intention. The stitches were removed and he made an uneventful recovery, regaining the power of speech slowly, but in a month was all right—as good as ever. The only medicine I gave him was tinct. of aconite in two drop doses every three hours after the second day.

The negro has been at work at a cotton seed oil mill for three years or more, making them a good hand, not complaining of his head at all. I have examined his head several times, and there is no depression or anything to show that any of the skull was removed. About three weeks ago his father came to me, asking me to make Jim quit drinking and to know if I could not make the other hands quit giving him liquor, as he was drunk all the time. Last week Jim had two fits.

(DISCUSSION OF PAPERS BY DRS. NOBLE, MITCHELL, WIATT AND MILLER.)

DR. M. W. O'BRIEN, of Alexandria, Va.: As Dr. Miller has said, in the unconscious state every case must be considered by itself. The history is most important, and every means of diagnosis should be used in cases following injuries, and still we may not be able to explain the condition. I recall two cases.

In a wreck an engineer was caught under his engine. He had a broken elbow and was scalded all over; his legs and thighs showed burns of second and third degree. He said he was not hurt and refused to get in the ambulance, which was in waiting, but said he would get in my carriage. When he reached his house he would not allow them to help him out, but walked in and walked upstairs. He showed a disposition to sleep a good deal. His temperature was 102 and pulse quick, and he appeared somewhat queer to me, but the family thought he was all right. The functions of the body were naturally performed and he went along for six days, when suddenly he lost control of himself after sleeping and tried to jump out of a window and said he would kill himself. I quieted him with opiates, and under daily hypodermics he got all right, no untoward mental symptoms showing.

The man told me that he had no knowledge of those six days. He is now really well. It was a condition that appeared strange, and I am unable to account for it.

In another case a brakeman was on top of a box car, the train moving about thirty miles an hour; he was struck across the shoulders and about the head by a piece of lumber projecting from another car on an adjoining track. He fell on soft ground and was brought to me unconscious. He could be aroused, but would fall asleep again. The pupils were dilated, and he wanted to be left alone. The functions of the body were normal, and he took nourishment when it was brought to him. He would go back to sleep, and he lay this way for four days. I had others to see him with me, but they could not make anything out of it. After four days his mind cleared up, and since then he has had no trouble.

I have seen many cases presenting disorders of consciousness, so I am inclined to believe this mental state is common, following injury, and the unconscious state is one for careful study.

As to prognosis in duration of the unconscious state, I have seen it stated that if they live twenty-four or forty-eight hours without relief or a clearing up mentally that they will die, but I do not think this is true. They may go a good deal longer than that without serious lesion underlying the symptoms.

One of the best descriptions I have seen of this condition is in Fagg's Practice. The book is a little old, but it is certainly excellent. It is a subject, however, that is very broad, and I feel that I am not very well informed as to the cause of the peculiar mental phenomena often found after injury, and "Diagnosis and Prognosis of the Unconscious State" should receive in each case the most careful study and consideration.

Dr. Miller has given us a most excellent paper.

Dr. Geo. H. Moran, of Morganton, N. C.: A man employed on a wood train desired to stop off at his home and jumped from the train and was thrown around and the engine struck him in the back of the head. When I saw him his breathing was stertorous, pulse slow, and looked as if he would die every moment. I opened the wound in his head and removed fragments of bone. He was unconscious for three days and after that his memory seemed slowly to return. First he remembered that he was at work and not able to do his work well, and finally was on the train, and he kept on until he reached the point of jumping off the train, but he could not recall jumping from the train. I could not account for this until I found that a lawyer had been to see him and he did not want to admit that he jumped from the train.

Dr. W. C. Day, of Danville, Va.: In regard to the point of not being able to remember how the accident occurred, that is a very common occurrence. I have had a number of cases who were rendered unconscious and after recovery were unable to remember anything about the accident, and they did not have any suit and there was no cause for their not telling if they could remember.

Dr. W. C. Connally, of Dallas, Ga.: As to the prognosis in the cases of unconsciousness, I have had cases of concussion of the brain that have remained totally unconscious for eight days, and recover. When they returned to consciousness they would take up the thread of events that were in their mind at the time of the accident.

Dr. W. M. Cunningham, Corona, Ala.: I had occasion to read a paper before the Charleston meeting, calling attention to this peculiar phenomenon. I took the position at that time that in all cases of profound unconsciousness that we did have a blotting out of the memory of incidents just prior to the accident. My observations since then have borne out my paper, and I have seen a number of cases that were unable to recall anything that occurred just prior to the accident. It is a fact that in cases of profound unconsciousness that as soon as their friends have occasion to prompt them they can remember the incidents, but it is for us to decide whether they really do remember them. If we will take pains to keep these friends away from them I think in most all cases of profound unconsciousness, whether long or short time, we will find a bloting out of the memory prior to the accident. This is important to us as railway surgeons in making our statement as to the cause of the injury. If this holds true it is well for us to make a note of it in taking the statement of the patient and observe whether he has been prompted by his friends. With a slight degree of unconsciousness, although for a long time, yet a man may regain memory of everything that happened. All of you have probably noticed that any one falling from a height never remembers falling. I have never seen a case yet that remembers going down, but he usually remembers everything just prior to falling.

Dr. J. M. Masters, Newport, Tenn.: This involves a psychological question of great importance. The mind is the aggregate of all the intellectual attributes that we have. Somewhere in our brains is the seat of memory which records the events of our lives. When recorded absolutely and fully, they are indelible. When accidents occur as to render one unconscious, then it is not indelible. When shock occurs this record ceases to be formed. This is the explanation of the fact that a person does not remember the events occurring just before the accident. It is a point worthy of consideration.

Dr. T. E. Pruitt, Grand Junction, Tenn.: I had a case of a negro man who was struck by another, driving his skull in for about half an inch. This man never lost consciousness. I was sent for and trephined the skull and found the dura mater involved and some brain tissue escaped. The man never did lose consciousness and I kept cold applications to his head and he got over it. Before he got strong he went deer hunting and shot his hand off. He got over that, and two years afterward was splitting rails and I presume he had a cerebral hemorrhage, as he was dead before I got there.

Dr. A. C. Hoss, Jonesboro, Tenn.: I would like to know if there is any appreciable lapse of time between the happening of the accident and the impression on the memory?

Dr. Thos. H. Hancock, of Atlanta, Ga.: In this connection I will recite a case of my own experience. When a boy I was in the habit of riding race horses, and on one occasion I was coming home, having been down in Fluvanna county, Virginia, when my horse ran away with me. I was not afraid as I had ridden horses before when they were running. When I found I could not hold her, I let her go, and simply sat still on her back, knowing that I had left the gate open and that she could run till she got tired. When we came to the gate the horse was running at about the rate of a mile in 1.44; at least we were going at about that speed when we made the turn in the road which was about half a mile from there. After making this turn in the road I remembered nothing until I found myself lying on the ground. Some one had closed the gate and in her effort to stop I had been thrown and knocked senseless. I remembered making the turn in the road, but I had no recollection whatever of either seeing the gate or of being thrown. From that day to this it has never come back to me.

Dr. E. Denegre Martin, of New Orleans, La.: This discussion is most interesting and whereas brain force is yet an unknown condition, I personally believe in the molecular theory, which would to me explain some of the phenomena of injury. We may liken it to a vibrating instrument. If struck lightly the vibrations will be disturbed and the instrument will temporarily show signs of irregularity, but again resume its regular rhythm. If the blow or shock be of sufficient force, it may stop altogether. A blow upon the skull with a pointed instrument will cause a fracture with localized lesions but a fall upon the head, causing no fracture but concussion, will produce the gravest sysptoms, unconsciousness, hemorrhage, temporary or even permanent injury.

Dr. W. M. Cunningham, Corona, Ala.: I desire to say a word about one point brought out by the speakers. I refer to the loss of memory of incidents occurring just prior to an accident producing unconsciousness. I had occasion to read a paper at our Charleston meeting calling attention to this peculiar phenomenon. I took the position at that time that in all cases of profound unconsciousness we did have a blotting out of the memory of incidents happening just prior to the injury. My observations since then have borne me out in that position. I have seen a number of cases in which they were unable to recall a single incident that occurred just prior to the accident.

The matter is of importance to us as railway surgeons in recording the patients' statements as to the cause of his injury after he regains consciousness. He invariably does not know how he was hurt, nor what he was doing at the time of injury. True, after his friends have advised with him and made suggestions to him, he may appear to recall the incidents. It is for us to say whether or not credit should be given to his statement.

It is well for us to make a note of this failure of memory following the unconscious state in our report. A man rendered slightly unconscious or when even profound unconsciousness is slowly induced (as in anesthesia) may recall all the incidents. It is the sudden and profound cases that have this deficiency of memory. All of you have doubtless observed how any one falling from a height rendering him unconscious, never remembers going down. I have never seen one yet who did, and usually they do not remember the happenings just prior to falling.

Dr. J. H. Mitchell, of Mount Vernon, Ill. (in closing): I have only this to say: When I selected my subject I did it with quite a good deal of hesitancy, as I did not know how a paper on so ancient, obscure and "noli me tangere" subject would be received. But Dr. Wiatt, Dr. Miller and Dr. Noble have papers along the same line, and thus the subject has been discussed pretty thoroughly. I have nothing to add.

Dr. S. R. Miller, of Knoxville, Tenn. (in closing): The question of brain injuries has been a very interesting one to me, and I enjoyed Dr. Wiatt's paper very much. My paper was written with an "axe to grind" for the company. I believe that along this line we can save a great deal in the next year. I can illustrate this by giving one case. A man had climbed to the top of a box car to see if the brake was loose. He said that the brake wheel struck him on the head, but I had half a dozen witnesses who heard him say that he remembered falling between a box car and a flat car and knew it and threw himself on the outside. I am just as sure that man had an attack of vertigo and not a thing hit him, but that he hit something after he fell. There was no reason for the man to claim disability for eight months, and the company ought not to pay for that injury. He had a case of vertigo and the company has enough to pay for without having to pay for that. I think that if we watch these cases carefully we can present them so that the company will not have to pay an unjust suit. We should not change the facts, but when they are in the company's favor we should cinch them when we have an opportunity.

TRAUMATIC NEUROSES OF HYSTERIA TYPE.*

By EUGENE D. BONDURANT, M.D., Mobile, Ala.

First thanking your President for the appreciated privilege of appearing before you here to-day, I would ask your attention to a class of nervous affections which possess a peculiar practical interest for the railway surgeon as well as for the neurologist—the traumatic neuroses of the hysteria type.

Hysteria is a nervous disorder, the existence of which in any individual is *prima facie* evidence of neuro-degeneracy. It is a definite clinical and pathological entity, having a constant and characteristic symptomatology, and it is not by any means identical with that peculiar condition of emotional instability in women to which we loosely apply the term "hysterics." It is not a disease, if by disease is meant deterioration in cell structure. It is a disturbance of nerve function due to disarrangement of the association tracts of the cortex cerebri. Psychologically, it is characterized by disturbance of the normal relation between the receptive cortical sensory areas and the field of consciousness, resulting in the exclusion from the sphere of consciousness of many sensory and ideational impressions, with concentration upon, exaggerated perception of, and abnormal reaction to other sense impressions, in particular to those presented to consciousness through the reinforced sensory activity which we denominate "suggestion." The concrete result is gross perversion of normal volitional as well as of sub-conscious activity, impairment of thought processes and disturbances of conscious feeling. For the development of this disturbance inherited structural defect and functional instability are necessary. The required exciting cause is provided in the unfavorable influences of disease, malnutrition, shock, nerve stress or suggestion.

The hysterical temperament is characterized by diminished emotional control, diminished power of resistance to painful or otherwise unfavorable impressions received via the sensory or ideational mechanisms, and by enormously increased suggestibility.

Hysteria often reproduces the symptoms of organic disease. This imitation, however, is on the part of the patient unconscious, unintentional, involuntary and uncontrollable. The hysterical subject is not a malingerer.

Accurately speaking, hysteria is a psychosis rather than a neurosis.

Traumatic hysteria is hysteria whose manifestations are precipitated by trauma. In nature, symptoms, and clinical course it does not essentially differ from hysteria in which trauma is not an etiologic factor. In traumatic hysteria, however, we find the causative influence of morbid suggestibility especially prominent, and in many cases degenerative stigmata relatively inconspicuous. In fact, the onset of hysteria may be the first and only evidence of degeneracy.

In explanation of this fact it should be borne in mind that physical injury exerts a depressing effect upon the nervous system familiar to us as surgical shock. Add to this depressing effect the disorganizing influence of apprehension, fear or unreasoning terror; and then while the entire mental fabric is thus disorganized and consciousness dominated by the resulting emotional wave, introduce the powerful suggestion of injury arising in the patient's ideational fields, or unconsciously and unintentionally presented to his hyperesthetic attention by the excited and irrational behavior of fellow sufferers, bystanders, sympathizing friends or emotional doctors, and we have etiologic conditions ideally favorable to the development of a traumatic hysteria. The relative magnitude of the morbid suggestion is thus sufficient to precipitate hysterical manifestations in persons who do not prominently show the stigmata of degeneracy, and in whom previous evidence of hysterical tendency was not discovered.

Hysterical complications may appear at the time of or shortly after the receipt of an injury, or at some subsequent time. They may be of sudden onset, or may slowly and gradually develop as time passes. The severity of the sequent hysteria bears little or no relation to the amount of physical injury received.

Turning now to a consideration of the symptoms of traumatic hysteria, we may or may not have as a background certain physiological degenerative stigmata. As the specific clinical features of the disease we have functional disorders of common sensation, of the pain sense, of the special senses, of motility, of the reflex and trophic mechanisms, as well as disturbances of volition and of consciousness.

For the sake of clearness, these different classes of symptoms are best studied in separate detail:

Disorders of sensation are probably the most common of the neuro-abnormalities met with. They occur most frequently as cutaneous anesthesia and analgesia, either of which may be partial or complete, usually the latter. The distribution and extent of the areas of anesthesia vary widely in different cases. Half the cutaneous surface may be involved, or the trouble may be confined to one or two small spots. The insensitive areas are sharply circumscribed. They may be symmetrical, *i. e.*, the same in size, shape and location, on either side of the body. The most characteristic and important fact connected with them is that they do not coincide in extent with the cutaneous distribution of any nerve or group of nerves, and that they could not be produced by organic injury to the peripheral or central nervous organs. These anesthetic fields are often inconstant in location, shifting from place to place. They are not rarely removable by magnets and by other modes of suggestion.

Closely related to these disturbances of cutaneous sensibility are the anesthesias of mucous surfaces, the soft palate being the most frequent location, and the well-known disorders of the special senses manifested as hysterical deafness, hysterical amaurosis, and the especially characteristic concentric narrowing of the visual fields. Hysterical pain and hyperesthesia are also met with.

Disturbances of motility are nearly as common as are those of sensation. They are shown as partial or total paralysis of motion, or as tremor, spasm or contracture. Traumatic hysterical paralysis is oftenest complete. It may involve any of the voluntary muscles; is frequently shown as a monoplegia, hemiplegia or paraplegia. It is a typically flaccid paralysis. There is none of the muscular atrophy of paralysis due to organic disease of the peripheral motor neuron, and none of the spasticity and rigidity shown in paralysis due to central lesion. When one of the lower extremities is involved a somewhat characteristic gait is shown, the paralyzed leg being dragged helplessly along without the foot drop of peripheral disease or the spastic circumduction of organic central paralysis. In this form of motor neurosis, the electrical reaction of degeneration is not present, but we find in almost all cases a pronounced diminution in both galvanic and faradic excitability.

Hysterical tremor is less frequent, but sometimes typically shown. It most resembles the tremor of paralysis agitans It varies in intensity from time to time, or appears and disappears. It is rather easily influenced by suggestion. In a patient of my own it could be induced at any time by suggestion, that is, by simply assuring the patient that an attack would occur.

Hysterical spasm and contracture sometimes accompany or follow hysterical paralysis, and may occur independently. They are at times quite persistent. I had one patient who remained in bed three years with it, finally recovering. The contracture and spasm are characterized by absence of any evidence of organic central or peripheral disease.

The typical hystero-epilepsy, the major hysterical convulsion, and some of the minor manifestations of hysteria, such as the *globus hystericus*, are not frequently found in the traumatic form of the affection.

Associated with the sensori-motor abnormalities above described, we often find some alteration in the character of the reflex activities. The superficial reflexes are diminished or absent. The deep reflexes are slightly diminished, slightly exaggerated or, most usually, normal. Ankle clonus and the Babinski reflex are not shown in hysteria.

Cutaneous tropho-neuroses are occasionally met with in traumatic hysteria, varying from the commonly shown local coldness or congestion or simple dermographism, to the rarer forms of local sweatings, capillary bleedings and imitations of dermal disease.

The mental disturbances in hysteria have already been touched upon in general terms. They are always psychic degenerative in character. The so called "hysterical insanity" is simply any form of insanity which happens to complicate a hysteria. It is not a common result of trauma.

In any given case of traumatic hysteria we would probably meet with a combination of several or many of the specific symptoms above sketched, such, for instance, as motor paralysis with anesthesia and analgesia in same area, diminished superficial reflex response, diminished galvanic and faradic excitability in the affected area, together with the suggestibility, lowering of volitional and inhibitory tone, and possibly some other of the numerous intellectual weaknesses of the hysterical degenerate.

Permit me again to remind you that the situation of the neuronic disturbance causing the paralysis of motion and of sensation, and the other symptoms of hysteria, is in the cerebral cortex, not in the peripheral motor or sensory nerves, nor in the lower automatic centres. Sensations in the hysterical subject are normally received and transmitted, but are arrested in the lower cortical levels, failing to reach the sphere of consciousness—being shut out, as it were, by a break in the association neuron circuit along which co-ordinated sense impressions flow to consciousness. Similar breaks in the lines of efferent cortical discharge result in motor paralysis. This hysterical paralysis is a typical paralysis of volition. The power of voluntary movement may be lost, while reflex, automatic and other involuntary movements may still be possible in the paralyzed part. These facts explain the seeming incongruity of a patient with a hysterical paralysis of sensation and motion using his paralyzed arm which he cannot voluntarily move to brush from his anesthetic face a fly which he cannot feel.

In turning now to a consideration of the diagnosis of hysteria associated with trauma, I feel impelled to remark that the recognition of any form of disease must be preceded by recognition of the fact that the occurrence of such disease is possible. The physician who thinks that there is no such thing as traumatic hysteria is not likely to diagnose many cases of it. A prime requisite is a knowledge of how to conduct a neurologic examination. If to this is added a knowledge of the symptoms of organic central and peripheral disease, some acquaintance with the principles of cerebral and spinal localization, a knowledge of the distribution of the peripheral nerves, and a little familiarity with hysteria in general, together with the laws of suggestion, a correct judgment should usually follow. The first task is that of excluding real injury to the nerve tissues. The diagnosis of the existence and location of organic lesion of the peripheral nerves and central ganglionic masses is, as a rule, easy, the recognition of focal injury to the nerve tissues being one of the most accurate and satisfactory diagnostic accomplishments of medical science. And still it is well not to be too sure. I once diagnosed, to my entire satisfaction, a traumatic hysterical paralysis in an injured patient. The autopsy held three days later revealed a broken neck.

Another task which confronts the railway surgeon especially, is that of differentiating real hysterical symptoms from the gross exaggerations and pretense which you continually meet with in persons claiming pecuniary recompense for injury. This introduces the very broad subject of the detection of malingering, a subject too broad to be dealt with here. I would only say that, excluding by adequate examination organic injury and the neuroses of the hysteria type, the remainder is pretense or exaggeration.

To give you a few practical points in the diagnosis of traumatic hysteria, I would say that any of the following should suggest the existence of *this* neurosis:

Flaccid paralysis, without alteration in muscular tone and without muscular atrophy.

A total hemianesthesia or hemianalgesia.

Insensibility of the palate and fauces.

Suddenly occurring aphonia.

Concentric limitation of the visual fields.

Sharply circumscribed areas of complete anesthesia or analgesia not coinciding with the distribution of the cutaneous nerves.

The discovery of any of the major hysterical stigmata would of course settle the diagnosis once for all.

It should not be forgotten that hysterical disorder may supervene upon organic injury to the nervous system—that we may have a mixture of traumatic hysteria with symptoms of unquestioned organic lesion.

The duration, clinical course and termination of the traumatic hysterical neuroses are influenced and determined by the same conditions which apply to hysteria in general. The prognosis is unfavorable in direct ratio to the degree of inherited nervous instability. In cases in which the hysterical disturbances are made the basis of a suit for damages, recovery is scarcely to be expected until after final adjudication of the case, the environment and mental attitude of these patients tending to maintain the disorder. Traumatic hysteria accompanied by permanent physical injury has an unfavorable prognosis, owing to the permanence of the morbid suggestion. Generally speaking, all of the mild and most of the severe cases eventually get well.

Any discussion of the treatment of these ailments lies without the province of this paper. I would only say that, as in other forms of hysteria, success is attained by increasing general vitality and nervous stability, and by displacing the morbific suggestions by impressions more favorable to normal nervous activity.

In conclusion, I can best present for your consideration a clinical picture of the disease under consideration, as well as some of the problems of diagnosis, by briefly reporting an interesting case which came under my observation a short time since.

The patient was a practicing physician, 47 years old, previously healthy. In crossing the railroad tracks he was struck by a switch engine and received, along with other injuries, a blow on the left side of the head, sufficient to render him unconscious, so it was claimed.

The doctors who attended him diagnosed a fracture of the skull with injury to the underlying brain tissue. They stated that the patient remained unconscious for two days, and that upon regaining consciousness he was found to be paralyzed on the entire right side. This paralysis was in their opinion due to injury to the brain caused by the blow and by a depressed fracture. The company's surgeon dissented absolutely from the opinion of the other physicians, taking the ground that the man had been hurt very slightly, if at all, that he had no fracture of the skull, had not been unconscious, and that the alleged paralysis was a fake and the patient a fraud.

The man brought suit against the railroad for $25,000. I was asked by the company, the patient consenting, to make an examination to determine the nature and extent of the injury, which was done four months after the accident, and resulted as follows:

Patient was a large man, well-nourished, his general appearance that of robust health. He walked laboriously with crutches, making no use of his paralyzed leg which he dragged helplessly after him. The paralyzed arm dangled loosely beside him. He seemed willing and anxious to be examined, and talked readily and freely of his accident and of his paralysis. The location of the wound on his head was pointed out. There was a slight scar on left side of the forehead, anterior to the motor cerebral area, but I could detect no evidence of depression.

These neuro-abnormalities were shown:

1. Seeming complete anesthesia and analgesia of the right lateral half of the body, sharply defined at the median line.
2. Complete flaccid motor paralysis in the same area.
3. The patella tendon and other deep reflexes were slightly exaggerated on both sides, not more so on the paralyzed than on the uninjured side. No Babinski reflex could be elicited, and no ankle clonus was shown.
4. The plantar, cremasteric and abdominal reflexes were diminished on the affected side.
5. Electrical excitability was diminished on the paralyzed side to both faradic and galvanic stimulation. No reaction of degeneration was shown.

There was no muscular atrophy nor impairment in muscular tone. There was no rigidity, and no suspicion of spasticity. The spastic gait was absent. There was no oculomotor paralysis, no paralysis of the facial muscles, tongue or palate. The mucous surface of the palate and fauces was insensitive. No pupillary abnormalities. No speech defect. The mental state might be regarded as normal. The patient was emotional and amenable to suggestion. When he was led to believe that a painful electrical test was being applied to his well side he made a great demonstration of bracing up and trying to stand it, and after the current was turned off gasped for breath, groaned, asked for water and to be fanned, etc., had a sort of "nervous fit." The current used was not in the least painful.

There was no evidence whatsoever of irritative or destructive cortical lesion.

My diagnosis was hysterical paralysis. I based my opinion upon the existence of a total hemianesthesia and hemianalgesia, flaccid motor paralysis without muscular atrophy, the diminution in the superficial reflexes and diminished galvanic and faradic excitability, and the typical gait of hysterical paralysis.

The condition shown could not have been caused by brain injury, for there was entire absence of the deep reflex exaggerations, ankle clonus, rigidity, and spasticity characteristic of central motor paralysis.

A complete permanent hemianesthesia also cannot be produced by a cortical lesion insufficient to produce mental and other disorders, and is practically never found as a symptom of central brain injury. I regard the contention that the paralysis was due to a depressed fracture or to any other kind of organic cerebral lesion as absolutely untenable.

The conclusion that the man was malingering is a much more likely alternative, if my diagnosis of traumatic hysteria be not accepted.

The patient had borne a somewhat unsavory reputation, had been involved in damage suits before, and had, I am told, been guilty on these occasions of exaggeration and misrepresentation. It might be possible for a patient to pretend an analgesia and paralysis such as was shown in this case. But in my judgment the analgesia was real and the motor paralysis was real.

There can also be no doubt of the existence of the diminished superficial reflex response and diminution in electrical excitability, neither of which could possibly have been consciously imitated by a malingerer.

The diagnosis of traumatic hysteria seems justified.

I will say, however, that I only saw the patient once, and that I scarcely feel that this limited opportunity for studying the case makes possible the absolute exclusion of malingering.

The case came to trial. I testified that there was absolutely no evidence of brain injury, and that the paralysis shown by the patient was certainly not due to any brain injury. The surgeon of the company testified that there was no fracture, no brain injury, and no paralysis of any kind, but that the patient was perpetrating a fraud. Every other doctor in the town—some ten or a dozen of them—testified that the man was badly hurt, and had a severe brain injury, and was suffering from hemiplegia due to said brain injury. The jury gave a verdict for the plaintiff for $10,000. The railway company appealed the case, but finally settled by compromise. This patient will pretty surely recover from his paralysis.

These traumatic neuroses are not such infrequent accompaniments of railway injuries, and must occur in the experience of many of you gentlemen. They merit your careful consideration. I trust that my effort at introducing them to your notice at this time may at least elicit some discussion, and I thank you heartily for your attention.

(DISCUSSION OF PAPER BY DR. BONDURANT.)

DR. M. CAMPBELL, of Knoxville, Tenn.: I was very much interested in the very able paper by Dr. Bondurant in regard to traumatic hysteria. It is a more frequent result of wounds than is commonly supposea, but not so common as neurasthenia. Dr. Bondurant made a very able diagnosis in this case, and which I think he proved conclusively and that any neurologist would be satisfied that it was a case of traumatic hysteria. He gave the differential diagnosis very thoroughly. There was no evidence of organic lesion. Never in my experience has there been an absence of the exaggerated reflexes in paralysis or organic lesion of the brain. This result is inevitable.

Another point, in the experience of Gowers in hysterical paralysis, there is never a facial paralysis with the hemiplegia. This is true in all cases that I have examined.

I was very much interested in the doctor's description of functional cases of hysteria, and his account of the association of fibers. Would that he had gone more fully into that. The theory of hysteria is that it is a disturbance between the mind and the brain; that it is a mental disease. However, this is untenable, as it does not explain the phenomena of hysteria. We as physicians readily accept the idea of the unity of the mind and body, and that the mind is the function of the cerebrum, although this does not mean that the brain secretes thought as the liver secretes bile.

All our ideas are based on the sensations to the general senses, and numerous sensations compared together give us ideas, and we compare one idea with another, and thus we see the relation between ideas.

This doctrine of monism being the opposite of dualism is proved by diseases of the brain. When the brain is diseased we have a corresponding impairment of the mind. Whenever there is overstimulation of the sensory centers we have hallucinations and delusions. Stimulation of the brain quickens the mind, or it may be impaired by over stimulation. A clear conception of the different conditions explains hysteria and disposes of the difficulty of studying the relation between the mind and body, and the action and reaction of the mind and body upon each other.

Dr. S. G. C. Pinckney, of Atlanta, Ga.: Dr. Bondurant's paper is on practical lines that we meet all the time. It is almost a daily proposition to be consulted about these cases. Malingering is very rare in small places, but in the large cities where we have a number of damage suit lawyers it is quite frequent. In New York the other day Dr. Collins and I went down to the court house and a case was on trial then for $50,000 damages. The woman plaintiff in the case was brought into the court room by two people and was apparently unable to move, but the lawyer got her excited and she forgot herself. However, hysteria is a real disease, but it is not generally so considered from the fact that it passes off and the patient recovers. The great point for the neurologist is to differentiate hysteria from the real neuroses. One point to be considered is the areas of anaesthesia of the skin. It is rare for a physician to examine for these areas of anaesthesia, yet they are real and can easily be made out if the doctor will go over the skin very carefully.

Another thing is the vision. The limitation of vision is very real in the hysterical patient.

Also the examination of the pharynx. It is almost impossible for a normal person to restrain from gagging when you rub the fauces with paper. Of course it is possible for them to cocainize the throat but they are not apt to do this, and this usually may be eliminated.

Also the gait is very characteristic. I saw a case of damage suit against the Georgia Railway a few years ago. Was sent down to Augusta to see the case. When the case came into court the gait was so characteristic that I had no doubt that it was hysterical. Points like these are of great importance, and will often decide your case. Dr. Bondurant has expressed the opinion of the entire neurological world in regard to these cases. I have seen these cases a number of times where there was no question of damages involved.

Dr. A. C. Hoss, of Jonesboro, Tenn.: I believe the doctor defined hysteria as a pathological entity. I cannot subscribe to that decision. I have seen cases that come to me and find a uterine lesion, and by curing this would expect to remove the hysteria. I have seen the hysteria continue after the condition was relieved. To my mind the hysterical state is due to some molecular change in the cerebral organization. It is true that we have never been able to determine what they are, but certainly something is going on to briug about this condition. I have seen it in the masculine sex where they could not possibly have any defect in the genital organs.

I would like to ask the doctor what effect that definition would have before a jury?

Dr. J. H. Mitchell, of Mount Vernon, Ill.: I have a little illustration which I can give to the association. It is in reference to a case of hysteria of that character, and it made a very good exhibition for the parties who were in the case. A gentleman claimed to have been injured and kept complaining all the time of trouble with his spine and unable to get about well. He was placed astride a chair and one electrode of a battery having been applied to the neck, when the other was suddenly applied to the lower part of the back, the patient, with an expression, the meaning of which was not to be questioned, jumped clear over the chair and thus it was found that the patient was not so crippled as he thought.

Dr. Bondurant (in closing). I am obliged to the members of the association for the interest shown in the discussion of my paper.

There is one point which should not be lost sight of, and that is the fact that in traumatic hysteria the patient is, as Dr. Pinckney has just reminded you, really injured and not malingering, despite the absence of organic lesion. An interesting medico-legal problem for future solution is the amount of compensation to which these patients are justly entitled.

Replying to the inquiry as to what a jury would think of my definition of traumatic hysteria, I would say that my paper was not written for a jury, but for a gathering of intelligent medical men. For practical use in the court room the explanations could and should be made much more simple.

Regarding the allusion to the so-called hysteria in women associated with pelvic disease I would remark that usually this is not a hysteria at all, but simply the manifestations of neuro-degeneracy aroused by disease and the resulting ill health and depression in nervous vitality.

(On motion of Dr. Pinckney, a vote of thanks was tendered to Dr. Bondurant for his most excellent paper.)

* * *

SOME CASES OF PENETRATING WOUNDS OF THE EYE.*

By M. W. O'Brien, M.D., Alexandria, Va.

To the railway surgeon no class of injury is more important than penetrating wounds of the eyeball. Not only is the injured member to be considered, but its fellow is in danger and is often lost. "If thine eye offend thee, pluck it out." Surely wisdom is in this quotation. They were wise men in that day and generation.

Case 1. Construction department. Having found a torpedo, a man laid it on the bank and threw stones at it. It exploded and a piece of metal struck his eye, splitting the cornea, cutting through at the sclero-cornea junction, letting out the contents of the anterior chamber, the lens and much of the vitreous, but did not lodge. There was more hemorrhage than I had ever seen in this class of case. There was great shock, vomiting and collapse. I did enucleation within a few hours and recovery ensued. But for the fact that he exploded the torpedo, which at first he denied, his attempt at law would have given the Company an expensive verdict.

Case 2. A man was shot by his companion, the shot, No. 8, sprinkling his face. At least four went through the upper lid and must have lodged in the posterior chamber. Hemorrhage in the vitreous clouded his vision and he could not count fingers. Atropia, ice and bandage, with rest in bed on his back, gave him a good eye after a while, though an iridocyclitis developed. There has been no trouble of late years, though I believe some of the shot are in the posterior chamber. Vision is not perfect of course, but there is fair sight.

Case 3. This case shows what nature can do and how sometimes the physician is mistaken.

A negro track hand, while driving spikes, was struck by a splinter of metal at the base of the upper lid. I found tension low and vision greatly impaired. I thought I felt the metal through the wound in the lid. I sent this case to Dr. Wilmer in Washington, who did not think the foreign body had penetrated. The man went to his home and six weeks after, when the swelling and pain had passed, he came back to work and to see me. In the scar, I felt a piece of metal. With forceps I caught the base of the fragment and removed a splinter of steel ¼ inch long and ⅙ inch broad at the base, and 1-32 inch thick at the base. This gave great relief and the man got well with a good eye and excellent vision. The fragment pierced the lid and sclerotic, behind the sclero-corneal junction, and projected into the vitreous, the base holding it, in the sclerotic.

Case 4. A machinist apprentice was facing a piece of metal, and a fragment from the chisel struck the eye, cutting through the outer third of the cornea, dividing the sclero-corneal junction and letting out, of course, the aqueous, some of the vitreous, and displacing the lens. I could not tell, nor could Dr. Wilmer, whether the metal had lodged or not. Atropia, bandage, etc., was the treatment. There was much nausea and vomiting in this case. Tension was low, and there was hemorrhage in the posterior chamber. After six weeks or so, a staphyloma developed and distress was experienced in the uninjured eye. I did enucleation and found the contents of the globe disorganized and a piece of steel about ¼ by ⅜ inch lodged in the retina near the entrance of the optic nerve. The Southern Railway was sued and the verdict was for the Company.

I show a drawing of this case.

Case 5. A machinist was struck in the eye by a piece of metal from a hammer or chisel, which made a clean wound through the outer third of the cornea and divided the sclero-corneal junction, and penetrated $\frac{1}{8}$ inch into the sclerotic. The metal did not lodge in the eye. The aqueous and some of the vitreous was lost. I tried to save the eye for appearance sake. The wound healed, but a cyclitis came on with bulging of the cornea, and chronic inflammatory changes made it necessary to enucleate. I found the lens almost absorbed, and what was left buried in the vitreous. The symptoms of irritation in the sound eye subsided promptly and there has been no trouble since.

Case 6. A machinist, while using chisel and hammer, was struck in the eye by a splinter of steel. I saw him within a short time. I found a small splinter of steel had pierced the cornea on the outer side near the sclerotic and had penetrated the anterior chamber, but the broad end had not gone entirely through the cornea and so the fragment was held and had not passed entirely into the anterior chamber. With a cataract knife, I carefully coaxed the wedged-shaped splinter out as it had entered. Some aqueous escaped, but closing the lids quickly and with compress and bandage, all after awhile came right, with entire recovery.

Case 7. A boy was shot with a twenty-two caliber bullet from a small rifle. The bullet entered near the tear duct and penetrated the eyeball. There were symptoms of cerebral injury. I thought the ball had passed through the eye, and penetrating the apex, had entered the brain. After a period of unconsciousness, the brain symptoms passed. The wound healed, and though sight was lost, the eye was not removed, and the boy got well. No sympathetic trouble has followed, and in all respects the boy is in good health, now some years after.

Case 8. A machinist helper was struck by a splinter near the inner canthus. Enlarging the wound in the conjunctiva, I saw a small, dark wound in the sclerotic. Tension was low and he could barely count fingers held close. Atropia opened wide the pupil, and putting on a compress bandage, I sent him to Dr. Wilmer, who found hemorrhage in the vitreous and the retina detached in the upper quadrant. Vision 1-200. Bandage, rest in bed, and ice for one half-hour every four hours was advised. Believing a foreign body was within the globe I placed the man in Dr. Wilmer's care at the Episcopal Hospital. The doctor attempted after a few days to remove the foreign body through the wound entrance with the giant magnet, but failed. He later made the attempt through a new opening, and the piece of metal was drawn forward and removed. It measured 7 mm. in length and 2 mm. in width. A severe inflammatory action ensued. The pupil was dilated, but the plastic exudation has clouded the space, though the cornea and anterior chamber are clear. There is no pain in the eye now. Apparently vision is lost permanently because of inflammatory changes in the posterior chamber. For this reason I doubt if any benefit will result if the opaque lens is extracted. This case is still under treatment.

In all cases it is important to determine, if possible, whether the foreign body is within the eyeball. This can often be done, but not always, even by the most approved diagnostic methods. If found, and it is possible, it should be removed. If the powerful magnet is used, often serious damage is done, and though the offending substance is located, the magnet often cannot remove it. Then enucleation should be undertaken and promptly. It seems that shot are the least harmful of all foreign bodies lodged within the globe. Brass is very bad, because when found the magnet does not influence it. I think much depends, too, on the velocity of the foreign body. All these cases, I believe, should be given prompt hospital treatment and be under the care of a skilled specialist, who has every means of diagnosis and treatment at hand.

In my cases certain degenerative changes have almost uniformly followed penetrating wounds of the eyeball. With or without prolapse of the iris, proper and prompt treatment means everything. When the foreign body enters through the cornea and lodges in the posterior chamber, the injury is a most serious one, and this is also the case when it enters through the sclerotic and rests in the vitreous. When the wound is at the sclero-corneal junction, whether the foreign body lodges or not, it is a very serious matter and the eye is often lost. When the foreign body lodges in the anterior chamber, be it large or small, unless quickly located and removed, the eye will probably be lost. It is a responsible position for the surgeon, when after all diagnostic means have failed, he is unable to state whether or not a foreign body is within the eye and then by enucleation discovers it. It is especially regretable to the railway surgeon.

FIRST AID TO THE INJURED EYE.*

By M. F. Coomes, M.D., Louisville, Ky.

There are two cardinal points to be considered when a railway surgeon takes charge of an employee for his company, namely: the welfare of his patient and the interest of the company. Both of these interests should be scrupulously protected, and to accomplish this, the surgeon when he takes charge of an injured eye (and the same is true of all other injured organs) should use the greatest care in determining the exact nature of the injury at his first examination, what is best to be done and when it is best to do it, whether at the time of his first examination or later when assistance can be secured, or whether it is best to refer the case to some one who is especially qualified to take care of such an injury.

The first thing to be learned and to be continually kept in mind by any surgeon who deals with an injured eye, is that everything which enters the affected organ should be sterilized, and there should be no mistake about this, because it is a well known fact that many eyes are lost from a simple corneal infection, or an infection through other wounds about the eye. The patient had much better suffer pain and inconvenience for an indefinite period with the foreign body in the cornea or beneath the lid, than to have anything introduced into the eye which has not been sterilized, and this lesson cannot be too firmly impressed upon the minds of surgeons, physicians and heads of departments about the shops where such injuries are most liable to occur. Indeed, it would be wise for every physician and surgeon, and the management of every corporation, to keep within easy reach certain articles to be used in case of injury to an eye. They may be contained in a small package and the directions for each may be so simple and plain that any one who can read may render first aid in a clean manner, if not otherwise scientific.

In the package which I hold in my hand will be found everything that is necessary. A 2 ounce bottle which contains 10 grains of boracic acid; a 2 drachm bottle containing 5 grains of cocain; and another 2 drachm bottle containing 1 grain of sulphate of atropin. By filling the bottles with sterile water, you have in these three, respectively, a 1 per cent. solution of boracic acid, a 4 per cent. solution of cocain, and a 1 per cent. solution of atropia. Full directions and the formula are on each bottle. You will also find in this package a number of little cotton mops which are composed of a pine stick and sterile cotton. You will further find a gauze bandage, 2 inches wide and 10 yards long, three droppers, and a small roll of oxide of zinc plaster one-half inch wide. This is an inexpensive little package, but I am sure it will be found of incalculable value to any physician or surgeon.

Remembering the facts stated in the beginning of this paper, let us assume that the general surgeon is called upon to take charge of a man who has recently received an injury to the eye, say a rent in the cornea in which the iris is engaged between the lips of the wound. In such a case the surgeon's course is very plain, and there can be no mistake as to what is to be done. If the man is suffering great pain, instill into his eye a sterilized 4 per cent. solution of cocain every five minutes until it has been repeated three times, and then if you do not feel competent to clip off the protruding iris the best thing to do is to instill into the eye a 1 per cent. solution of atropin sulphate, close the eye and place a firm compress over it, and send him to an ophthalmologist. This having been done the after treatment of such a case will depend upon the developments. If there is no infection, protection from the light and the instillation of atropin solution every three or four hours, so as to allay the pain, and the compress will constitute the routine treatment.

If the wound should become infected, then it will require a special line of treatment, which I will not go into detail with, further than to say that the continued management of the case should be under the supervision of an experienced ophthalmologist.

BURNS.

The management of burns about the eye is a very important matter and too much care cannot be exercised in these cases. It occasionally happens that molten metal is blown into the eye, and sometimes powerful chemicals, and the result is that the conjunctiva lining the lids and covering the eyeball is seriously damaged, and the great danger is the occurrence of adhesions between the burnt surfaces, constituting what is known as symblepharon. At first sight, one would not think that adhesion between the lid and the covering of the eyeball would produce any great amount of inconvenience, but it does, and keeps up a constant irritation; hence the great desideratum in the management of these cases is to prevent these adhesions from becoming permanent.

In all ordinary burns, where there is no liability of adhesions occurring, probably the best treatment is the free use of carbolized oil, sterile olive oil or sterile albolene oil. Five drops of carbolic acid in an ounce of either of these oils is sufficient. This application should be made several times a day. Where the burns are more extensive, retractors should be introduced beneath the lids night and morning, and thorough stretching carried out so as to prevent adhesions. While the daily use of the retractor is necessary in young infants, in adults it may be dispensed with by the employment of a wax cast fitted over the globe, made of sheet paraffin, such as is used by dentists. This can be molded very readily over the thumb if an artificial eye cannot be obtained.

After the cast has been properly shaped, a hole should be cut in the center so as to give the cornea freedom and prevent irritation of that structure. This shield can be worn for several days, and it is not necessary to remove it to cleanse the eye, as it can be slightly lifted from the eyeball which can thus be thoroughly washed and medicated. You will note from the specimens of this shield which I here present that they are very pliant and easily softened and molded into any special shape by placing them in warm water, after which they are permitted to cool by immersing them in cold water, and will then retain practically the shape which has been given them. No harm can result from these shields, and I am sure a great deal of good will follow their use. They may be worn for months if necessary. Very thin sheets of lead may also be used for preventing these adhesions. They are applicable to the lower, but hardly so to the upper lid, and no one would use lead when paraffin can be obtained.

ENUCLEATION OR REMOVAL OF THE EYE FOLLOWING INJURIES. WHEN SHOULD THIS OPERATION BE PERFORMED? A PLEA FOR CONSERVATISM.*

By J. A. White, A.M., M.D., Richmond, Va.
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Southern Railway, etc.

That the eyeball is often needlessly removed, thus producing a great and irremediable mutilation, is a fact that my experience in injuries of this organ has impressed upon me. And again that it is not removed sometimes when it should be is an equally patent fact, thus exposing the patient to the risk of sympathetic involvement of the other eye, and in consequence hopeless blindness.

As I said in a former paper on injuries of the eye: "The loss of an eye is of equal gravity with the loss of a limb; therefore no precaution should be spared to prevent this misfortune. An injured eye does not, however, receive the same consideration as an injured limb. Formerly many a limb was sacrificed by amputation that to-day would be saved by our improved methods and greater knowledge of the possibilities in such cases. Amputation is now the last recourse after every effort to save the limb has failed.

"As it was formerly with injured limbs, so it is still, to a great extent, with injured eyes. A serious wound involving the coats or inner structures of the eye, the supposed entrance of a foreign body, or even blindness due to the effects of concussion call for the immediate removal of an eye in the opinion of many surgeons. They argue the eye is or will become practically blind; there is little or no chance for its recovery as a useful organ; the other eye may be imperiled through sympathy by waiting, and its removal will save the patient a long and tedious period of slow healing. Moreover, if a railway case, the road or hospital association will be at a considerably less expense. Hence the eye is removed when very often treatment might have saved it.

"It is rare that there is any immediate demand for the removal of an eye. No harm can come from waiting awhile if the eye is kept under daily observation, and often a chance for saving it may develop even in a seemingly desperate case that might be considered hopeless. Sympathetic trouble in the other eye is most likely to occur in from two to eight weeks after the injury and may possibly come on at any time, but in reality it is only in a small percentage of injuries that it occurs at all."

It is difficult to lay down any hard and fast rules for the guidance of the local surgeon in regard to enucleation, as even the ophthalmologist of wide experience is often in doubt in deciding this question. In many cases the expectant plan of treatment as above suggested is the best, but this will depend on the kind of injury and the resulting complications.

The teaching of most text-books, briefly stated, is that an eye should be removed that has a penetrating wound of the ciliary region, or a foreign body anywhere about its interior, because of the probability of sympathetic ophthalmia in the uninjured eye. My experience has taught me that this doctrine may be modified, and that eyes that have suffered these very injuries may now and then be saved. I have at different times reported cases in proof of this statement. Hence I am an advocate of conservatism in treating injured eyes because enucleation can be held in reserve as the remedy of last recourse.

Since the introduction of the magnet into ophthalmic surgery many eyes have been saved that would have otherwise been enucleated. But a properly constructed magnet is not everywhere available, and eyes are still removed from time to time that could be saved by this means. There is no need for this on any of our railroads these days, as the injured persons can always be sent to some point where a proper magnet can be used.

Time does not permit, nor is it exactly pertinent to my subject, to enter into this question extensively, but a few words about the magnet and its correct use might be of some service. We have the giant, the medium sized and the hand magnet. The hand magnet is a very useful instrument and many cases require no other, especially just a short time after the entrance of the piece of iron or steel. The giant magnet in difficult or older cases is the surest to remove the foreign body, but on account of its size and weight, from 150 to 200 lbs., it is not easy to manipulate and if used unskilfully can do much damage. The medium sized magnet, taking all views of the subject, is the most satisfactory one for general use, and, as a rule, meets all the requirements of any but the most exceptional cases. The medium sized magnet I use is the Sweet magnet, made by Meyrowitz, but I find my hand magnet very serviceable.

It so often happens that a case comes to us with an eye wounded by a chip or splinter of iron or steel without the actual penetration of the latter into the interior of the organ, that it is well to make sure of its presence before making any attempt to remove it. I have known eyes removed for the supposed entrance of a foreign body which on examination after the removal showed no trace of one, and I have also seen eyes irretrievably damaged and even infected by surgeons searching for a supposed foreign body with a probe.

Immediately after the injury the ophthalmoscope is all we need to determine the presence of a foreign body in nearly every case. Later, however, as the great majority of such bodies enter the eye through the cornea or scleral margin and often wound the lens, the ophthalmoscope becomes useless because of the clouding of the latter. The longer the splinter is in the eye the more difficult its localization becomes. The magnetic needle (the sideroscope), the Roentgen ray or skiagraph, and the magnet itself are all used for this purpose. If the location of the splinter is known, its mode of removal is easily determined. The magnot itself is valuable in determining the presence of a particle of iron or steel, as the patient is nearly always conscious of a pulling sensation, usually attended with pain. But its absence does not contraindicate a foreign body. The condition of the field of vision is sometimes of value in locating the foreign body, and should be made use of.

Sometimes we remove these splinters through the wound of entrance, sometimes through an incision specially made. For splinters in the vitreous I usually make an incision in the sclera between the external and inferior recti if I cannot use the entrance wound, but always make a conjunctival flap to protect the incision. The point of the large magnet is approached towards the center of the cornea to draw the foreign body forward and around the lens into the posterior chamber whence it can be guided through the pupil into the anterior chamber and removed from the eye. Rarely is it advisable to do an iridectomy, but sometimes it is necessary.

Occasionally the magnet fails us entirely. I have had more than once to give it up as a failure and on repeating the effort the next day been successful. Again I have failed entirely after several attempts.

Even when the removal is successful the eye may be lost from infection, the germs having been lodged in the eye by the foreign body, or the foreign body may have done such damage to the interior that vision is partially or completely lost. Still, the damaged eye is better than an artificial one.

Even when infection has taken place it is not absolutely necessary to remove the eye at once. I have seen cases of limited infection occurring from the entrance of a foreign body or a penetrating wound where a good eye has resulted from conservative treatment, but on account of the grave consequences that might possibly occur in these cases, such as the extension of the infection backward with meningeal complications, or thrombo-phlebitis, or thrombosis of the cavernous sinuses, we must watch them with the closest attention. A general infection of the eye can follow simple wounds of the cornea as well as the deeper and more penetrating injuries, or from foreign bodies.

Where infection has advanced so far that operative intervention becomes imperative we have to decide between enucleation and some substitute operation, because enucleation is not a perfectly safe operation if the suppurative process has involved the surrounding orbital tissues, or has already extended backward so as to make it doubtful whether we can get a clean socket. Where these complications are present it would be much safer to perform *evisceration.* I would say, however, that as compared with the substitute operations, enucleation is better than any of them except under such circumstances as just mentioned, because evisceration does not, as a rule, give a much better socket for a glass eye than enucleation, and the time for recovery is very much longer. Mules' operation with the implantation of a glass ball in the empty sclera has been attended with many failures, and in all of them the ball ultimately escapes.

Such foreign bodies as cannot be removed with a magnet may in some cases become encysted and not necessitate the removal of the eye, but these cases should be carefully watched, and at any sign of irritation in the injured eye it should be removed. If the foreign body is in the lens, however, enucleation is not necessary.

Wounds of the ciliary body are usually considered the most dangerous forms of injury to the eye, are more likely to be followed by sympathetic disease in the other eye, and are, in the opinion of most authors, an indication for the prompt removal of the eye. Still I have seen injuries, and bad injuries apparently, of the ciliary body get well with a very useful eye, and without any apparent risk to the other eye, provided there has been no infection and the wound heals without a depressed scar. Consequently I would advise conservative treatment of these cases also, and to defer enucleation until we can get some idea as to what the result is to be.

Injuries from concussion, such as intraocular hemorrhage, dislocation of the lens and detachment of the retina, may require in some cases enucleation, especially in dislocation of the lens, because glaucoma or cyclitis may result sooner or later unless the lens is extracted. These complications would require the removal of the eye, but before doing so the extraction of the lens should always be attempted, because the patient can be no worse off if this effort fails, whereas, if it is a success, the eye is saved. I have seen occasional recurrent hemorrhage starting up from concussion and continuing until the eye was so disorganized that it was necessary to remove it.

From the foregoing remarks, therefore, you may infer that the question of removing an eye after an injury, or performing one of the substitute operations for enucleation, hinges entirely upon the risk the patient runs of losing the second eye by sympathetic inflammation, and this risk, whilst squarely faced, should not be magnified nor minimized. We know that it does occur in a small percentage of cases of injury, and general experience has taught us in what class of cases we are likely to meet with it. But we also know that it is impossible to predict the result in any one of such cases, as the majority of them never manifest any symptoms of irritation either in the injured or the sound eye after the wound has healed or the immediate symptoms of injury have disappeared. Moreover, investigation of the closest and most scientific nature has failed to reveal the nature of this affection, the cause of its appearance, or the way of communication from one eye to the other. No theory propounded has been satisfactorily demonstrated. All have been built upon apparently strong foundations which have crumbled away on the first vigorous assault. Probably the theory of transmission by the ciliary nerves (the reflex theory) is to-day more strongly entrenched and more widely accepted than any other, although for some time it was in disfavor. The theory of transmission by way of the optic nerve (MacKenzie's), the theory of bacterial invasion (the germ theory) and the cytotoxin idea cannot explain the clinical facts in sympathetic ophthalmia as satisfactorily as the reflex theory, and yet we are far from being able to demonstrate the latter.

The time of its most probable development is rarely earlier than two weeks or later than eight weeks after the injury, although after that time it may make its appearance at any time dependent upon the outbreak of irritative symptoms in the injured eye. Why it should appear in some eyes and not in others when the same identical injury exists is one of the things we cannot explain.

Removal of the injured eye is supposed to prevent the transmission of the irritation to the other, although occasionally the sound eye becomes involved even after an early enucleation.

Again, removal of the injured eye as a rule arrests the process of *sympathetic irritation* in the sound eye after it has begun, although not invariably. But sympathetic *inflammation* is rarely arrested by the removal of the injured eye if the process is allowed to go that far. Here I draw a decided distinction between irritation and inflammation. Sympathetic *irritation* is readily arrested and cured—sympathetic *inflammation* is rarely or ever arrested or cured.

When an eye receives an injury whether by a penetrating wound, with or without the entrance of a foreign body, or by a blow which causes damage to the interior of the eye, every effort should be made to prevent the loss of the organ.

The eye should be freely irrigated with a normal salt solution, a saturated solution of boracic acid or a solution of bichloride of mercury (1 to 5000) to thoroughly clean the conjunctival sac and lips of the wound. If any of the uveal tract projects between the lips it should be cut off level with the cornea or sclera. If the wound is in a locality that permits of it, it should be covered by a conjunctival flap. If a foreign body has entered the eye it should be located, and if iron or steel it should be removed, if possible, by the magnet. If this fails on the first attempt it should be tried again. In most cases atropia and adrenalin should be instilled. Then the eye should be filled with sterile vaseline (1 to 3000 of bichloride) and a light bandage applied. This does not apply to burns, as I never use bandages when the lids or conjunctiva are burned, as free movement is necessary to prevent adhesions. The bandage should be removed every three or four hours and hot water applied to the closed lids to stimulate healing. With this treatment most injuries will heal in from ten to fourteen days.

If infection sets in in spite of these precautions due to the entrance of germs at the time of the injury, enucleation or evisceration may become imperative, although I have very recently saved to a Southern Railway employee a goodlooking sightless eye, which became infected after the removal by the magnet of a piece of steel in the vitreous. He had all the early symptoms of panophthalmitis which subsided under leeching, hot applications and iodide of potash.

If the wound, whether of the cornea, ciliary region or sclera, heals smoothly without depression, it is rare that sympathetic irritation or inflammation supervenes.

If the eye continues inflamed or irritable after two weeks, and especially if the sound eye shows any signs of irritation, enucleation is indicated. Evisceration is not as reliable as a preventive of sympathetic ophthalmia. After the eye has healed sufficiently to dismiss the patient, he should be warned of tho possibility of trouble and told to apply for treatment at once if the injured eye ever shows signs of irritation.

This is all that is necessary for men of ordinary intelligence. But in the case of ignorant or stupid people or children we are often confronted with the problem as to whether it is not best to remove a damaged eye that might cause trouble than to take any risks which they have not sense enough to appreciate, notwithstanding the handwriting on the wall which would be legible enough to most people.

Here maybe it is well to call attention to a condition we meet with that simulates sympathetic irritation, which may be due to a simple cold in the eye or to strain from refractive errors, and which might mislead a careless observer into removing an eye uselessly.

Operators differ about their methods of performing enucleation. When it is properly done it will give a very good bed for an artificial eye, and the improvement in the manufacture of artificial eyes makes it possible to hide the mutilation so that one not familiar with the patient would hardly know that the eye had been removed.

I do all my operations for enucleation under cocain unless there is violent inflammation present which would interfere with the absorption of the cocain solution. It is only in painful eyes and in panophthalmitis that I made use of general anesthesia. I usually make an incision around the cornea through the conjunctiva, catching up each muscle as if I was going to make an advancement, and pass a catgut stitch through it and tie it to the conjunctiva over it. When the eye is removed I fill the space with a plug of gauze, and then put a pouch stitch around the conjunctival opening which when drawn together to the center, after the removal of the gauze plug, pulls the recti muscles to the center, thus giving more motion to the conjunctival surface than could be had if the muscles were allowed to retract.

(DISCUSSION OF PAPERS BY DRS. O'BRIEN, WILLIAMS, COOMES AND WHITE.)

DR. . M. BURDETT, Lenoir City, Tenn.: I would like to ask the Doctor to give his best treatment for burns?

DR. H. T. A. LEMON, of Washington, D. C.: No class of injuries concern me more than injuries to the eye. I have heard with great interest Dr. O'Brien's paper on Penetrating Wounds of the Eye. I have had two cases, and although each case was sent to a competent oculist, yet both developed pan-ophthalmitis.

DR. M. W. O'BRIEN, of Alexandria, Va. (in closing): The question as to whether a piece of steel is still in the eye is one that bothers me most. As stated in my paper, I have used all means of diagnosis at hand, and had skilled men to look at it. but unable to determine whether there is a foreign body in the eye. You may possibly say that you don't think there is anything in the eye, and he goes ahead and has trouble and the eye is taken out and you find a big piece of metal in it. Probably somebody else would have found this and saved the eye, and the patient bring suit and get a big verdict, and you would not be in a very pleasant situation.

Every means was taken to find the piece of metal, and yet it could not be found, but when the eye was removed there was the piece of metal. The magnet sometimes can be used as a means of diagnosis and determine in that way whether the metal is in the eye. But the magnet may do harm in drawing the metal forward so as to add to the trauma.

Sometimes the piece of steel cannot be found by the magnet, or it becomes entangled and cannot be removed. In most cases I have found it necessary to do enucleation to save the well eye.

I believe that all these cases should be placed in the hands of skilled oculists where every means of diagnosis and treatment are at hand.

DR. M. F. COOMES, of Louisville, Ky.: I have nothing to say except in answer to burns. The treatment depends upon the condition. The chief thing to be avoided is adhesion between the conjunctive of the ball and the lid. Olive oil and constant stretching of the lids will be sufficient in small burns. Where the burns are extensive these paraffine casts are used, and they can remain several weeks without any irritation.

DR. J. A. WHITE, of Richmond, Va. (in closing): As Dr. O'Brien says, the magnet may do damage while drawing the foreign body forward. I have here a piece of steel half an inch long and it has jagged teeth. This was pulled through the vitreous, and that man now has a vision of 20-30, and his vitreous is perfectly filled. I happened to have this in my pocket, and it shows what the magnet can do.

I want to say a word about Dr. Williams' remarks. I don't know whether every one exactly appreciates the special point that Dr. Williams makes about the lantern over the worsted test. The latter test is used by all authorities. It occurred to me some time back that signal lights should be used to test railway men, and I have demonstrated since that a man may pass as being all right with the worsted test, but will be just the opposite with the lantern test. I remember the case of a fireman who was a superior man and had accepted this position simply to work up in the service. He was passed by the C. & O., but the lantern test turned him down. It demonstrated that he was unsafe. He passed the worsted test but did not pass the lantern test. When they call any shade of red green, then they are unsafe men.

Dr. C. Williams, Boston, Mass.: I have nothing further to add except to say ditto to what Dr. White has stated. The only colors which throw a man out of the railway service are the mixing of the reds and greens. These are the ones which he uses. I am glad that Dr. White and I quite agree.

SOME OBSERVATIONS UPON EYE INJURIES.*

By DUNBAR ROY, M.D., Atlanta, Ga.

Clinical Professor of Diseases of the Eye, Ear, Nose and Throat in the Atlanta College of Physicians and Surgeons.

The more extensive becomes my clinical experience with injuries to the eye, the more am I convinced that their management is an exceedingly delicate proposition and the final results certainly problematical. I am firmly convinced that every injury to the eye, it matters not how slight, should be treated with every degree of precaution and expectancy. Hot cinders, particles of steel and iron, concussion, lacerations around and in the eyeball itself, may all be the "beginning of the end" so far as the future value of such an injured eye is concerned.

All things being considered, the severer the injury to the eye, the greater are the chances for its destruction, and yet I have seen eyes lost as the result even of a hot cinder embedded in the cornea. It is exceedingly unusual for an infection to be carried into the cornea by an injury from a foreign body, but where infection does take place in these cases it is usually due to the lack of cleanliness in the removal of such foreign matter. Consequently I make it a rule to sterilize every instrument used in the performance of this little operation, flushing thoroughly the conjunctival cul-de-sac, and even using a drop of atropin solution should there have been much abrasion of the anterior epithelial membrane.

Four cases occurring in my practice during the last two years illustrate so peculiarly different types of injury, their symptoms and method of treatment, that I take the liberty of giving each in detail, and from them to draw some practical conclusions.

1. In January, 1903, Miss L. T., aged 18, was accidently struck in the left eye by a particle of broken glass. There was produced a linear rupture of the cornea at the inner inferior quadrant with some prolapse of the iris. She was admitted to the hospital two days after the injury. On examination I found the rupture as stated—the iris entangled in the wound and the anterior chamber almost filled again. There was not the slightest bit of irritation or pain. Atropin solution was ordered to be dropped into the eye every two hours and a firm compress bandage to be applied. The pupil dilated partially and the feeling of the eye was made more comfortable. In one month's time the eye was practically well, and there was a smooth white cicatrix at the point of rupture. The lens was not affected, but an exudate had almost closed the pupillary space. About the middle of April, two months after injury, the patient appeared at the clinic with some irritation in the right eye indicative of a mild iritis. Atropin solution was instilled and it was soon discovered that there were some posterior adhesions, the dilatation failing to reach its maximum. On ophthalmoscopic examination there was found some haziness of the vitreus. Here was evidently a typical irido-cyclitis or sympathetic inflammation in the good eye, presumably the result of the injury in the other eye. It was now a question as to whether enucleation was justifiable at this stage. The following argument was considered:

1. There was a well developed irido-choroiditis in the good eye, and it was very questionable whether enucleation at this stage would have any decided influence upon such an active process in the sympathizing eye.

2. The injured eye was not entirely lost, and with a future iridectomy there might be a restoration of at least a minimum of vision in this eye.

3. There have been cases reported where by treatment of an active process in the sympathizing eye, this might be arrested and at least useful vision result.

Under these circumstances and after consultation with my colleague at the hospital, Dr. Calhoun, I decided not to enucleate, but to commence active treatment in the sympathizing eye. Prof. Laquer, of Germany, a year or more ago, reported several cases where he had arrested the inflammation in the sympathizing eye and in this way obtained useful vision. Active treatment was instituted by the hourly instillation of atropin solution and the internal administration of large doses of mercury and the iodide of potash, even to the point of physiological tolerance. One week later the vision had been reduced to light perception and the patient had to be led to my office. I still persisted in the treatment and also resorted to subconjunctival injections of large doses of bichloride of mercury. One week later the vision had somewhat improved, and to make a long story short, by sledge hammer licks in the active treatment of this case, three months later her vision was 20/70, and has improved still further so that she is able to earn a living and has no discomfort in the use of the eyes. I might also state that later I made an iridectomy on the injured eye which enabled her to count fingers when held very close and she has also the advantage of having the eye which was given her by the Divine Creator.

This case teaches us the very important lesson of persistent and continuous treatment even when all hope seems lost. I believe that many a physician gives up too easily when facing seemingly insurmountable obstacles; consequently I would plead for a redoubling of our energy where cases seem *in extremis*.

The case is interesting because of the fact that sympathetic inflammation followed the injury of one eye where this injury was confined entirely to the cornea. Ophthalmologists have learned to recognize the severity of any wound occurring just outside of the sclero-corneal margin as a possible cause for sympathetic inflammation, but a simple wound of the cornea, especially where there has been no infection, usually gives no fear of sympathetic inflammation. The trouble in this case was no doubt due to the entanglement of the iris in the wound, thus producing ciliary irritation. My own experience teaches me to always be suspicious of any injury where the iris will probably be caught in a cicatrix. Hence I am firmly convinced that it is precautious surgery always to cut away any prolapse of the iris when first seen after injury and, if possible, restore the edges of the coloboma thus made to the anterior chamber.

This case, besides one or two other instances, inclines me to the belief of the theory which holds that sympathetic inflammation is due to a reflex irritation through the ciliary nerves rather than to that which believes it to be due to a bacterial infection travelling along the sheath of the optic nerve.

Case 2. Mr. J. D. C., an important railroad employee, was injured in the left eye December 8th, 1904, by the bursting of an oil lubricator on the engine. He immediately returned to Atlanta and next morning he presented himself at my office, where I made a thorough examination. Several particles of broken glass were removed from the eye at the time of the accident, and the patient could not tell whether any more yet remained. After cocainizing thoroughly the eye, the patient was placed upon the operating table, and with a concentrated electric light the examination was made. There was very little pain or congestion about the eye. There was found a triangular rupture of the cornea at its nasal side, the iris not protruding but lying close against the wound, the lens swollen and already cataractous, the pupil pulled toward the wound, and vision equal O. By means of a probe and a magnifying glass there was found absolutely no evidences of the presence of particles of glass. The eye was irrigated thoroughly, the iris replaced, a strong solution of atropin instilled frequently, and a compress bandage applied. For three or four days the eye seemed to improve and there was scarcely any pain. About this time iritis began to develop and the swollen cataractous lens began to exude slightly through the corneal wound. This latter of course prevented the wound from healing. A severe iritis was present with considerable pain. The question of treatment now resolved itself as follows:

1. Should the eye be enucleated immediately, since there was considerable probability that it was already lost and any possibility of sympathetic trouble would thus be removed ?
2. Should we undertake to remove the swollen lens, lessen the internal tension, and give the patient a remote chance of saving the ball, with continued pain and irritation for many weeks?

After putting the matter plainly before the patient, the first argument was adopted, and ten days after the original injury the eye was enucleated. Almost at the beginning of the operation, under practically no pressure, the lens and vitreus escaped through the original wound, which showed that it was a matter of impossibility for the wound to have healed and that our decision to enucleate was the only proper one. The healing of the stump was uneventful, and two weeks later an artificial eye was adjusted, which he wears with perfect comfort.

This case teaches us that if there is a rupture of the ball, it matters not where, and the soft lens substance protrudes through the wound, it is impossible for the latter to heal and the anterior chamber to become filled again. In the future, should such a case come under my care, I believe that the proper method of procedure would be an attempt to remove the cataractous swollen lens immediately, irrigate the anterior chamber with normal saline solution and remove any of the iris that might be entangled in the wound.

My experience also teaches me that in cases of rupture of the globe, in the cornea as well as in the sclera, where an intense iritis supervenes, it is best for the patient to have that eye removed immediately, since in all probabilities the eye will later soften, and this will be followed by phthisis bulbi. The only question in these railroad cases is that of a future damage suit, where the exhibition of an empty socket is much more effective before a jury than even a shrunken eyeball. However, in all questions of this kind the physician's first duty should be to his patient.

Case 3. Mr. M. T. S., boiler maker at the Southern shops, was driving some rivets when a piece flew off and struck the right eye. This happened on the afternoon of Dec. 19th, 1904. There was no pain but an immediate diminution of vision. Next morning, Dec. 20th, the patient was examined in my office and the following condition found: Immediately at the central lower part of the sclero-corneal margin there was a rupture of perhaps 3 mm., with protrusion of a small tag of iris. Under cocain and thorough antiseptic precautions the latter was removed, leaving a clean iridectomy. The pupil was easily dilated *ad maximum* under atropin and an ophthalmoscopic examination made. Just back of the rupture there was a line of hemorrhage which seemed to be more extensive in the posterior chamber. The lens did not show any injury. Close to the optic disc there were two hemorrhagic spots in the retina. By the most minute examination nothing could be seen which had even the slightest resemblance to a particle of steel, although I was perfectly confident that it went inside of the eye. Haab's giant magnet was immediately used, both for a therapeutic measure and for diagnostic purposes. Absolutely no evidences of a foreign body were given. An x-ray photograph was taken by Dr. T. P. Hinman and this gave no positive signs of its presence. Vision equalled fingers at 2 feet. No pain nor signs of irritation. Knowing that many cases had been reported where very small particles of steel remained in the eye permanently without any untoward result, having reported one such case myself from the Clinic of Prof. Sattler in Leipzig, Germany; realizing that an attempt to locate and remove this small particle from the eye might do irreparable damage, and in the end it might not be located; cognizant of the fact that the patient lived where he could see me at any moment and appropriate treatment thus be given; also that the hemorrhage into the eye rendered it practically useless in either case; that there was no pain or irritation, with also the merest chance that the foreign body was not in the eye—under these circumstances I decided to treat the eye on the conservative and expectant plan by the use of atropin and rest. Without detailing this case, I will say that up to the present there has been absolutely no unfavorable symptom. The eye healed perfectly and there has never been the slightest pain. The vitreus is very cloudy and the fundus can scarcely be seen. The patient has returned to work and when last seen he was experiencing no inconvenience. Vision equalled fingers at 2 feet.

This case must still be considered as incomplete, as the injured eye must always be a "sword of Damocles" to this patient. In general the procedure adopted in this case was not one to be commended, for with almost positive knowledge that a foreign body was in the eye, enucleation was the proper remedial measure, especially as the vision was lost and there is always the greatest danger of sympathetic inflammation in cases of this kind. However, this patient has been very properly instructed as to reporting to me, and by close observation I hope to be able to anticipate any present danger. The great trouble in these cases is the impossibility of making the patient realize his danger, especially if there is still some vision and there is no pain nor suffering. Such patients will often be ready to sue you for damages should the eye be enucleated and some kind friend has told them that "an acquaintance had just the identical trouble and Dr. So and So saved his eye."

Just here allow me to show you the electro-magnet which I am accustomed to use in attmepting to remove particles of steel from the eye. It can easily be attached to an electric socket on a direct current of 104 volts. It is handy, strong, and has in several cases rendered me good service. It has the advantage over the giant magnet in that it can be easily manipulated about the eye, while with the larger one the patient's head must be accommodated to the magnet. However, the giant magnet is accomplishing results which can be obtained with none others, and I think it would be of inestimable value to the Southern Railway if they purchased one or two of these magnets and placed them at central points on their line, to be managed and used by the surgeons in their employ. Injured individuals could thus be quickly sent to these points, and perhaps many an eye saved which would otherwise be lost.

Case 4. L. C., boy, 2½ years old, was brought to me from Monroe, Ga., Feb. 14th, 1905, with the following history: About the middle of December last, he was playing with a stick in the yard when he fell and accidently stuck the end of it in his right eye. The eye became very much inflamed, but finally healed. About Feb. 1st the left eye began to be irritable, but his father thought nothing of it and consequently did nothing. On Feb. 9th they consulted Dr. Pirkle, in Monroe, who immediately recognized the severity of the case and sent them to me. On examination I found the right eye in an atrophic condition, slightly congested, and an old cicatrix across the cornea. The left was red and evidently quite painful to the patient. The cornea was clear but the iris was dull looking. The pupil was moderately dilated, but absolutely irresponsive to light. Strong atropin solution was dropped into the eye for one hour without any effect whatever upon the pupil. By a rough estimate the child apparently could only see large objects and in walking would often not notice these. As the injured eye was atrophic with no possibility of there being any vision remaining, I enucleated it immediately. Healing was prompt and normal. Into the other eye a strong solution of atropin was instilled every two hours, and 1/60 gr. bichloride of mercury given internally three times daily, alternating with the iodide of potash. Under this treatment the irritation began to leave the sympathetic eye, and at this writing the little patient has apparently no trouble in picking up small objects from the floor or even naming such objects as a pin when held two feet away. The eye will never have any better vision because the iritic adhesions and deposits in the vitreus are permanent. Such a case as this shows the importance of watching an injured eye for sympathetic trouble in the other. Experience, after all, is the best medical teacher, but only for those who will honestly correllate the same and be logical in their deductions.

(DISCUSSION OF PAPER BY DR. ROY.)

DR. C. P. GORDON, of Dalton, Ga.; I always send these cases to the specialist, but I remember one case in which a broom handle struck a man's eye, and I enucleated the eye and got good results. After it had healed I sent him to Atlanta to get an artificial eye. He got a beautiful eye and the stump permitted it to move quite naturally. I called on my patient when he got home and congratulated him on the good appearance, but in talking I saw that there was something the matter. In reply to my inquiry he said that he was not satisfied; that while it looked all right, yet he could not see with it.

DR. J. U. RAY, of Woodstock, Ala.: Dr. Roy touched upon one point which it would be well for us to take some notice of, and that is, what the country surgeon should do in reference to apparently insignificant eye injuries. A man jumps off of the train and you remove a cinder from his eye, and you make no report of it whatever, thinking it too small a matter. I wish to call the members' attention to the fact that we have a chief surgeon, and we should get in line and have a record of each case, no matter how small a case it may appear to the surgeon. In this way the department would have a record in case anything serious should result later.

DR. W. W. HARPER, of Selma, Ala.: I want to say one word on enucleation of the eye. I know this to be the experience of one of the best surgeons in the South. A man was blind in one eye, and it became necessary to remove the blind eye. After the operation and recovery from the anaesthetic it was found that the good eye had been removed. The surgeon had failed to mark the bad eye before beginning the anaesthetic. You should be sure to mark the eye you want to take out.

DR. DUNBAR ROY, of Atlanta, Ga. (in closing): I have nothing further to say. The point Dr. Harper makes is a good one, and of course the surgeon should be familiar with the condition before he operates. Such a mistake has been made by two celebrated surgeons, and his point is well taken.

ANTISEPSIS IN RAILWAY SURGERY.

By H. C. CRELLEY, M.D., Vinegar Bend, Ala.

Among the many problems presented to the railway surgeons, especially those distant from hospital conveniences, is that of the proper care and treatment of those who come under their charge.

Since the days of Lister and his carbolic acid spray, the question of asepsis and antisepsis has been uppermost in the minds of all surgeons.

We who are distant from hospitals have no ideal operating rooms, nor have we the assistants that we should have; but, nevertheless, we should never falter for want of these, and perhaps sacrifice lives that could be saved. I have performed operations with the patient placed on boards supported by boxes, nothing but tin vessels to hold solutions, and with my fountain syringe swung from a nail on the wall, having laymen as assistants. These are adverse circumstances for us to work under, but yet our fatalities are few. This, though, is all due to the proper and conservative use of antiseptics or germicides. Here I say "conservative," and this I mean, for too often that condition is brought about which we are combatting, by their improper usage.

Antiseptics, and under this head I include germicides, are to a certain extent corrosive in their action, and when used too often or too strong in open wounds are apt to cause cell necrosis, thus forming a nidus for the propagation of bacteria, producing suppuration and sometimes toxic absorption, which may perhaps result fatally.

Again, in the preparatory treatment of the integument before operation, some surgeons frequently employ antiseptic solutions for too long a time or of too great strength, and the irritant effect, extending down into the hair follicles, produces a folliculitis which, when we operate, should a suture pass through this area, may produce a stitch abscess, which may prevent healing by first intention.

I do not wish to convey the idea that I am opposed to antiseptics, for I am not; but I much prefer aseptic treatment of wounds when possible.

I think it a duty that classes should be formed, of the more efficient of our railroad men, and they should be instructed by our Chief Surgeon, or by some surgeon whom he may appoint, as to how to render first aid, to prevent or control hemorrhage, to properly cleanse wounds, and how to apply a temporary antiseptic dressing. This will not in any way interfere with our work, but will rather aid us, making our success more sure and our labors less tedious.

When a man is injured, how often the wound is stuffed with cobwebs and soot, any old dirty rag tied around it, and the case thus brought to us for treatment? How much better it would be had first aid been rendered in a proper manner. This question is already being agitated, and should be, and our Chief Surgeon should take it up with the Company and bring this about.

Again, every train should be supplied with an hermetically sealed package containing bandages, gauze, and bichloride tablets, with which to make solutions to cleanse the wound.

We should always have our instruments prepared and dressings thoroughly sterilized, ready to meet all emergencies.

Thorough flushing of a wound with a bichloride solution, followed by sterilized saline solution, the application of a mild antiseptic powder, and thorough drainage with frequent dressing, will yield the best results.

Frequency of dressing does not at all times control suppuration, and here I think that a curettement of the wound, breaking up pus pockets and removing necrosed tissue, and the continuous application of a sterilized solution at a uniform temperature of from 110 degrees to 130 degrees Fahrenheit, will often result in a quick and uneventful recovery.

As to the use of antiseptics in our patients, idiosyncrasies must be taken into consideration, especially in regard to iodoform.

The question of having hospital and relief cars is being taken up by various roads, and this is very essential; for in cases of wrecks distant from hospitals, when the patients can not be moved on any regular train, and when the surgeon is so situated that he cannot render the proper services, how pleasant it would be to have a hospital on wheels that could be run to his assistance! This car in itself would reduce the death rate.

Antisepsis has introduced a feature of conservatism in surgery that has saved many limbs to the wounded, that before its introduction would have been amputated.

We must be very careful to follow a line of aseptic and antiseptic treatment of wounds, to try to save limbs, and never to operate until a line of demarkation is established. Of course, this applies only to cases where the circulatory system is not rendered inert.

As to the care of instruments, no suggestions are necessary, for we have all had this indelibly forced on our minds.

Now, as to the hands of the surgeons. Here again the greatest care is necessary, and different surgeons have different methods for cleansing. It matters not how thoroughly we may scrub and scour and sterilize, it is hard to efface all germs from the hiding places they can find on our hands, especially about the nails, and I advocate the sterilized rubber glove. It may appear clumsy to us at first, but after using a few times we soon get accustomed to it, and our sense of touch remains quite acute. This, of course, is essential, for our fingers must frequently answer for our eyes in many wounds. I herewith give you my method of cleaning the hands:

First thoroughly cleanse the nails, then scrub thoroughly with brush and green soap; after this wash with alcohol, and then rinse in a sterilized solution. Now immerse the hands for a few minutes in permanganate solution, after which bleach them in a solution of oxalic acid. Then wash them in sterile water, and you are ready to operate.

(DISCUSSION OF PAPER BY DR. CRELLEY.)

DR. AMBROSE MCCOY, of Jackson, Tenn.: I think the Doctor has presented the subject in a very clear, concise light, and has laid stress on a very important matter that is sometimes neglected in preparing for operation, and that is, absolute disinfection of the hands.

DR. C. P. GORDON, of Dalton, Ga.: There was one point in the paper that interested me in regard to cleansing the field of operation, and that is that you might inflame the hair follicles and get infection from them.

DR. H. C. CRELLY, of Vinegar Bend, Ala. (in closing): In regard to the field of operation and the use of antiseptics, I want to mention a case I had not long since. A negro had his hand crushed and the fingers torn off by cog wheels. I was called to see him and put him on the table and amputated the lower third of the forearm. Healing took place all along the border of the sutures. Drainage was good and everything indicated good results until the eighth day, when I found the entire area suppurating, and following this gangrene set in, and the result was a second operation. In the meantime I found the patient had syphilis, and I began treatment for that. After the second operation I had the first results over again, but did not have gangrene. Now it is closing up.

DR. W. W. HARPER, of Selma, Ala.: Wherever you have to do an operation of a syphilitic patient you have to suspend the administration of the potassium iodide, as it will prevent primary union.

DR. GEO. R. DEAN, of Spartanburg, S. C.: The treatment of sprains depends upon the kind and the stage of the sprain. If seen at once after the accident placing the ankles in hot water or wrapping it in towels wrung out of hot water will give great comfort. Hot water and lotions following. I employ the adhesive strips in many cases with perfect results. Sometimes wet cupping is a good thing, followed by the use of the adhesive strips, but the treatment is varied to suit the condition.

INDICATIONS FOR AND TIME WHEN AN AMPUTATION SHOULD BE DONE.*

By E. DENEGRE MARTIN, M.D., New Orleans.
Professor of Minor and Clinical Surgery, New Orleans Polyclinic; Chief Surgeon, New Orleans & North Eastern R. R. Co.

You are indebted to your worthy president for the selection of this subject, and I think I see the wisdom of his suggestion, for even to-day, equipped as we are with all modern appliances for the practice of conservative surgery, I have sometimes suspected that a limb had been sacrificed before every known resource was exhausted.

To Crawford W. Long, suffering humanity owes a great debt, but to Sir Joseph Lister, the railroad employee, especially, is more obligated. Since the introduction of aseptic surgery amputations are rare, and many surgeons operate for weeks, even months, without amputating a limb.

Nothing is more interesting than to read old textbooks, written prior to our knowledge of the causes of infection, and to see the many theories advanced in regard to the results of the amputations and the cause of death. What an awakening it must have been to the older surgeons to learn the origin of putrefaction—to reduce the mortality in amputations from 70 to less than 10 per cent. from all causes. In those days it required the skill of the surgeon to amputate a limb; to-day it requires the skill of a surgeon to prevent its amputation. Surgery may make many advances, but not in the direction of amputations. Our technic is practically perfect, and he who fails to obtain the best results in the treatment of non-infected cases, should look to the weak points in his preparation and treatment.

In infected cases, of course, much will depend upon existing conditions. What are the indications for amputation? But one—destruction of the entire vascular supply. Just so long as there is life in the limb, there is also hope. As a rule any limb saved, no matter how weak, can be equipped with a brace that will far surpass any artificial leg, and especially is this true if one bone is intact. So long as the circulation is preserved, it is possible to combat almost any localized condition of infection. Has not the mortality in compound fractures been reduced from seventy to one-seventh of one per cent? Does this not in itself teach a most valuable lesson? The question arises as to the advisability of saving the limb even though it may be worthless after preservation, but with the experience of several cases which I can now recall, I am of the firm opinion that the effort should always be made. It is true that the prognosis at the time of injury may be doubtful, but when in doubt, wait. Should rupture of a vessel occur or gangrene ensue, there is always time to act, but under our present methods of asepsis, the danger of infection has been minimized and septicemia rarely follows. Should we find that after saving a limb it should prove useless, even when re-enforced with a brace, it is then time enough to amputate, and the point of election can be more easily determined. In my opinion then, indications for amputation mean solely death of the part, manifested by gangrene.

In regard to the second part of the subject, there is very little to be said with which you are all not already familiar. I have myself made it a rule in crushing injuries to do just so much as the emergency indicated, and to await the establishment of the line of demarcation that I might better select the point of amputation. Especially is this necessary when the injury is high up and the length of the stump in doubt. We well know how much better the skin will stand trauma than the deeper structures, and how frequently we have a comminuted fracture, with severe lacerations and contusions of muscles, and yet little sign of external injury. It is not unfrequently the case that amputations are performed, and within forty-eight hours an apparently well nourished stump will show signs of gangrene and reamputation at a higher point becomes necessary, or sloughing follows, which means a long and tedious process of repair. A second operation and a tiresome convalescence could have been avoided by waiting a few hours for the line of demarcation to develop, and then amputating. I know some of you will contend that the risk in such conservatism is great, but I question whether it is as great as subjecting the patient to a second operation. If the injured tissues are trimmed off and the bleeding vessels ligated, the stump properly protected from all sources of infection, and the patient allowed to rally from shock, we lessen the danger and can expect a better result and a shorter convalescence.

I would say, then, that the time to amputate when the injury is high up, or where there is special necessity for preserving as much stump as possible for the application of an artificial limb, is when we feel reasonably sure that no death of tissue will follow the operation. If, however, the injury occurs low down, and we can amputate at a sufficiently safe distance above the contused parts to assure perfect circulation and a primary result, amputation should be done at once. It is not always an easy matter to determine the result.

I recall a case which occurred during my studentship at Charity Hospital, which has left an indelible impression on my mind and which proves conclusively that the most serious injuries, including those of bloodvessels, will sometimes be overcome. A boy of sixteen was run over by the two front wheels of a box car, fracturing the femur just three inches above the condyles. So severe was the injury that the bones were shattered, the skin ruptured and the muscles and tendons almost pulpified. On introducing my fingers into the wound, I removed several spiculæ of bone, and could distinctly feel the artery pulsating, entirely stripped of its surrounding tissues. Up to this time our results with compound comminuted fractures had not been encouraging, and amputation was decided upon, as much from the fear of hemorrhage as the danger of infection. By a strange coincidence, the house surgeon had to attend a meeting of the Board that night, and having just saved a badly lacerated arm, I requested that I might be allowed to make an effort in this case. I am ready to admit, that the danger from hemorrhage or septicemia was not as well impressed upon my mind, on account of my utter ignorance of the subject, as it might have been. However, the boy's leg was put in a plaster cast, a drain inserted, and to complete the story, he left the hospital two months after on a sound leg, with but one inch shortening. I well recollect the comments of the late Dr. Miles upon this particular case; he said it was providential that he had been called away, and he was not so sure but what his absence had as much to do with saving the leg as my care and attention.

While in the same service, another case was brought into the ward, the result of a gunshot injury. Three inches of the tibia had been torn away, the fibula was fractured, and a large, gaping wound involving half the circumference of the leg resulted. At the end of three months the patient left the hospital on a brace, which to my knowledge he wore for years and which enabled him to do all the work of an ordinary laborer.

A third case, which must prove of interest to you as the result of a railroad accident, is one in which I was called in consultation by Dr. L. G. Lebeuf, Surgeon for the Texas & Pacific R. R. The engineer, believing that his engine was about to leave the rails, jumped for his life, and striking his leg against the rail or cross-tie, sustained a multiple fracture of the tibia, embracing about four inches of the lower third. Necrosis followed, and four inches of the entire shaft was removed, the periosteum being left intact; yet four months later this man resumed his position on his engine with a perfect tibia, the entire bone that had been lost being reformed, although a man forty-two years of age.

I could enumerate many other cases in which amputation seemed almost inevitable, and yet conservatism has given these people useful limbs.

We must then conclude that the time for amputation is, when the death of the limb is beyond any possibility of a doubt.

(DISCUSSION OF PAPER BY DR. MARTIN.)

DR. J. M. MANNING, Durham, N. C.: I wish to report a couple of cases. In April, 1904, an engineer, to avoid a collision, jumped from his cab and fell on one foot, driving the tarsal end of the tibia through the skin, fracturing the fibula. At first it looked like it would have to be amputated. I dressed it with every aseptic precaution, took out some pieces of bone and sewed up the wound. The man made an excellent recovery and some six months later resumed his position with the Southern Railway.

A colored boy was on a moving box car and jumped off and had a similar injury to the above. I put him on the same treatment as the other, and he is now in the hospital making a good recovery, and with the exception of a stiff ankle, will have a useful limb.

DR. G. B. THORNTON, of Memphis, Tenn.: While I agree with the doctor in his conservatism in regard to trying to save limbs from amputation, there is one point he did not mention. I speak from long experience. I believe that with a great many surgeons the tendency is to operate too quick after the injury is received; that we do not give the patient time to react sufficiently from the shock. I think that some cases result fatally because they are operated upon too soon. Conservatism should be practised wherever it can be done. There are doubtless limbs and lives which have been lost that could have been saved by conservatism, and especially is this obligation upon us now since antiseptic treatment has been so universally recognized and practised. On the question of amputating too early, I hold that no surgeon is justified in amputating until there is a return towards reaction. Nothing is lost by leaving a stump or crushed limb for some reaction where proper precautions are taken to prevent any damage from sepsis or hemorrhage.

Dr. T. E. Pruett, Grand Junction, Tenn.: In connection with the doctor's paper would like to report a couple of cases. Man was hurt while coupling cars. Right hand was crushed. Was carried to Oxford, Miss., where they decided that his hand must come off. As he lived at Grand Junction, he preferred his own doctor and came to me. I found a badly crushed hand and I decided to try to save it. For ten or twelve days the attempt looked hopeless, but from that time on granulations set up, and on the 26th day from the date of the injury the case was discharged. He is now at work on the railway.

On December 27, 1903, W. R., 12 years of age, while trying to board a moving freight train, fell and his right leg passed under the car wheels, severing the leg at the knee joint, the toes of the left foot were crushed, and he had a cut in the back over the gluteal region. The leg was amputated at the lower third, the toes of the left foot amputated, and arm and back dressed. While there was some suppuration of the foot and back, the patient survived. He is now well and gets around all right, and is ready for another ride.

Dr. W. S. Wiatt, East St. Louis, Ill.: I want to congratulate the doctor on his most excellent paper. Ideal surgery consists in saving limbs rather than in amputating them. The indications for amputation are as follows: Great loss of bone substance, destruction of the blood supply, uncontrollable hemorrhage, or uncontrollable suppuration. Dr. Martin has given the gist of the subject. If the integrity of the blood supply is preserved, amputation is not indicated. This can be demonstrated by the presence or absence of pulsation in the main artery below the point of injury. Frequently we see a crushing injury causing a comminuted fracture, with injury to nerve trunks and pulpifying of muscle tissue, and yet the arterial and venous trunks may not be injured. These are the cases in which a limb can often be saved, provided there is no interference with the trophic influence of the nervous system.

Dr. Ambrose McCoy, of Jackson, Tenn.: I don't think there is anything else to be said. I thoroughly coincide with Dr. Martin, and all who have discussed it, and I have nothing to add.

Dr. B. G. Copeland, of Birmingham, Ala.: I think they fail to recognize, at least Dr. Martin did not mention it, that these injuries are of a crushed nature. With crushing of the bones and soft parts and insufficient circulation will have such suppuration that the limb will be lost. When I am in doubt, I have the patient watched and when I am satisfied that amputation is necessary, I take off the limb. I have done this a number of times. Frequently I think that we can judge when to amputate beyond any question when we first see the case, and thus save quite a risk and give a good stump. It is rare that I have had a slough for a long time, and I do not make my incision so far away from the line of demarcation. I can usually tell by observation whether I am going to have a slough. Sometimes we take a little chance in order to save as much as possible. I remember a case of fracture of the lower third of the tibia. It was a compound fracture and almost the lower third of the tibia was exposed, and I took this off and then sewed the upper end to the astragalus and the child had a good foot, although of course there was ankylosis.

Dr. C. P. Gordon, of Dalton, Ga.: I had a case of fracture of the thigh some time ago. Of course I did not want to sacrifice the limb, and I put on a plaster cast with a window, and washed out thoroughly and drained. I tried it for about sixty or seventy days, and at the end of that time failed to get union. I then thought I would wire the ends together, and upon cutting down I found the bones in a state of necrosis, and I decided to amputate, and I lost the patient because I did not amputate at first.

Dr. E. Denegre Martin, of New Orleans, La. (in closing): In treating this subject, I have simply thrown out to you the general concensus of opinion as it exists to-day. Of course, it is impossible in this paper to discuss the different phases of the question. I did not mention shock, which would take up too much of your time. It is a question of one's judgment. It is not a question of amputation at the time of shock, but when it is best for the patient.

Again I confine myself solely to railway injuries of the leg. If you ask me when you should remove a leg, I say the very minute that leg becomes not only useless, but a budren to the patient, then remove it.

Dr. Copeland speaks of cases in which he knows amputation is necessary. These cases are easy to decide, but take injuries involving an entire leg and it may be hard to say what will have to be done. When you feel the anterior tibial pulsating you can generally make up your mind that there is a fair chance of saving the leg. That is a good rule to go by.

We have many badly infected cases at the Charity Hospital. For the treatment of these I have devised a hot-water drip, so arranged that it can be adjusted to any temperature. This is applied to these infected cases at a temperature of 120 degrees. The wound is usually covered with a piece of gauze, saturated in a one to one thousand bichloride solution and the drip applied over this. The gauze is removed several times during the day. The results are good.

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SOME REMARKS ON AMPUTATION OF THE LEG.*

By THOS. H. HANCOCK, M.D., Atlanta, Ga.

In our work as railway surgeons there will often be a question in our minds as to whether we should amputate a limb or not. I have seen three cases in which the wheels of a car had run over the leg of a man and the usefulness of the limb was not impaired in the least. In one case, the heel of a shoe over which the wheel passed saved the man's ankle, but in the other two there seemed to be no explanation why the limbs were not completely severed.

There is no fixed rule to govern us in these cases and we have to rely entirely upon our own judgment. We may get good results in some cases which look to be almost hopeless, and in this day of modern surgery there can be no reason for early operation, unless it is demanded to ligate a severed artery in the deep tissues, and even then amputation may be postponed. The old rule to save as much of the limb as possible holds good, I think, in all cases except those where the arch of the foot or the ankle-joint is involved. In these cases no prosthetic apparatus can be used after operation and I would prefer an amputation several inches above the ankle-joint.

Here is a young man who had such an amputation performed November 29th, 1903. He is a barber by trade, and is on his feet the entire day. He gets around almost as well as he ever did and can run quite well.

I once attended a lecture on surgery where the professor taught his class to amputate on a laboring man close to the knee-joint, so that the long stump would not be in his way when he was walking on a peg. This is not good surgery, of course, as the poorest laborer may some day be able to get an artificial limb.

If the leg is crushed high enough to involve the bursae of the knee-joint, I would prefer a disarticulation.

I can see no reason for removing the fibula, as recommended in some of the text-books, when the amputation would leave six inches or less of this bone.

Eight years ago a surgeon read a paper at our meeting here on "Simplicity in All Surgical Detail," recommending, among other things, the use of very few instruments. It is no small task for a nurse to clean and dry a large number of them, so let us use only those which we need; one scalpel, a saw, three needles, one pair of scissors and six artery forceps. This is a good needle and requires no holder (3 inch straight needle).

Chloroform is my favorite anesthetic, not given on the ordinary inhaler, which consists of a metal frame with a piece of gauze stretched over it, and which allows the chloroform to drip through, so that the nose and lips must be oiled to prevent their being blistered. The inhaled air should not contain more than 4½ per cent. chloroform, and given this way, it is very apt to be too concentrated. I prefer giving it on a folded towel, and remove it from the patient's face every time the chloroform is renewed. The hands serve to retain it in place so that the proper amount of air will be consumed. It requires a considerable amount of experience to become a good anesthetist, much more than it does to become a good amputator. I prefer the Esmarch's bandage for a tourniquet to the rubber tubing which some operators use. Apply it around the limb firmly eight or ten times and then place the roll under the last constricture. It is much easier to remove this than it is to untie the rubber tubing, and it is not possible to wound the tissues beneath it. We are now ready to shave the limb around the seat of the operation and to wash it thoroughly with soap and water. A good bath of strong mustard mixed with the bichloride solution (1 to 2000) will serve well for removing the oil from the skin and will aid in the sterilizing. This should be washed off in a few minutes with a 1-2000 bichloride solution, and then the parts should be bathed with ether. The hands of the operator and assistant may well be cleansed in the same way.

The circular skin flap is the best, unless from the nature of the injury there is a skin flap which can be utilized with less sacrifice of the limb. With the circular skin flap it is well to make a perpendicular incision over the fibula, so that the flap may be dissected back the more readily. This being done, we cut from without inward through all of the muscles directly down to the bones and, without stopping to scrape back the periosteum (a very bad practice), proceed to saw through them; but not before we have sawed off the sharp anterior edge of the tibia, for it will be very hard to saw off this edge or even chisel it off after the bones have been sawed through. We will not need a cloth retractor, as the fingers of the assistant will suffice to keep the soft tissues out of the way of the saw. Isolate the arteries and veins before ligating them with No. 2 catgut, and be very careful not to include the nerves, which should be cut with scissors, so that they will be shorter than the vessels. Do not use very hot solutions in the wound to check the oozing, but ligate any bleeding points which may remain after the Esmarch's bandage has been removed. Bring the flaps together from before backward, and round off the corners with the scissors; then suture with silkworm-gut, passing the needle obliquely through the true skin only, inserting it about an eighth of an inch from the edge and bringing it out the same distance from the edge on the other side. This will fold in the fat and subcutaneous tissue so that it will not protrude at various points.

Put in a small rubber drain, allowing it to protrude at one of the rounded corners, and fasten it in with a suture. Next apply iodoform gauze wet in the bichloride solution (1-2000), and over this sterile gauze moistened in the same solution, then sterile absorbent cotton and bandage. A well-padded splint should then be put on. The drain should be removed on the second or third day and the stitches on the eighth or tenth. There is no mortality and the wound should be entirely healed in two or three weeks.

DISCUSSION OF PAPER BY DR. HANCOCK.)

DR. D. W. MOORE, Jellico, Tenn.: I was pleased with the simplicity of Dr. Hancock's operation, and the few instruments needed for the work. I congratulate him upon his excellent paper.

DR. R. S. TOOMBS, of Greenville, Miss.: I cannot add anything to the operation that has been outlined. Amputations require thought and deliberation, and the doctor has so outlined his that he leaves little to be said. I don't take issue with him on any point. Ordinarily I can say that there is nothing better than the methods we employ to get the parts perfectly clean. The site of the operation is an important question when it comes to the future of the patient. I think the doctor is correct in making the operation as suggested. The matter had been so aptly illustrated by the doctor's case that none of us doubt the propriety of the steps in the operation.

One of the important factors in all operations is to see that the wound is perfectly dry. In a procedure of this kind we may expect union by first intention. Not long since I was called to see a patient who had developed fever with an amputation two days prior to this visit. The doctor asked me to open the wound, and to my utter astonishment when I reached the first dressing there came from the wound not less than an ounce of pus. This was a very shocking thing to me, and I could not account for it. The doctor confessed that he had closed the wound without drainage, and the wound was full of blood from the exudation. He suggested to me that it had been his experience that the application of the Esmarch bandage permitted more blood to collect in the wound after the operation. I am very fond of the round tourniquet, but I believe from the history of the case that this pus came from lack of dryness and co-aptation of the tissues. I have been impressed by many writers of the importance of having the wound thoroughly dry.

As the doctor has suggested, we should consider the welfare of the patient as well as the operation.

Dr. Thos. H. Hancock, of Atlanta, Ga.: In closing, I would only state in regard to the round tourniquet that it is hard to untie, and you are very liable to let the unsterile ends fly around and touch the wound. With the Esmarch there is no flying apart whatever, and no danger of infecting the wound with it.

In regard to keeping the wound dry, I think it well to keep it as dry as possible, although I like a wet dressing on the outside. When we get pus in a wound there is infection of some kind. It may not be due to carelessness on your part, but may be due to sutures, etc. I would not consider it due to blood left in the wound. It should always be removed, but it alone does not produce pus.

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FIRST AID TO AND INITIAL REPORT OF THE INJURED IN RAILROAD CASES.

By G. B. Thornton, M. D., Memphis, Tenn.,
Surgeon Southern Railway and I.C.R.R.

The duties of the railroad surgeon being twofold, it is necessary to consider him in a dual capacity.

First, as surgeon with the obligations and responsibilities incident to the professional surgeon, per se; and secondly, as an officer or appointee of the company whose interests he represents as such.

These latter duties of a non-professional character require accurate official reports, with names of witnesses to accident or witnesses to statement made by injured party. This preliminary report is required by claim agents and attorneys in adjusting claims for loss of time and damages for alleged responsibility for such accidents, etc.

The practical question of what constitutes "First Aid to the Injured," assuming that this is on first visit at or near the place of accident is to alleviate pain and guard against danger from shock or hemorrhage. There are no cases of an emergency character where shock is more frequently met with than in railroad injuries. Many injuries are of a sudden and violent character, hence shock more or less pronounced is so frequently in evidence.

The hemorrhage worthy of mention in these cases, as a rule, being from contused or lacerated wounds, is of a more passive nature than from clean cut or incised wounds, and is also retarded by the depression of shock before reaction is established.

For relief of pain the hypodermic administration of morphine with atropine, or atropine alone, and putting patient in most convenient place and best position for his immediate comfort. Atropine acts as a heart stimulant either directly or indirectly through the nervous system, and unless morphine is clearly indicated to relieve pain, it should not be used.

Serious hemorrhage should be controlled as quickly as possible, either by rubber band, tourniquet, or by compress and roller bandage. The ligation of bleeding vessels in open wounds is best, if practicable, before patient is moved. This insures more positively against recurring hemorrhage when reaction sets in, and is safest in transit to home or hospital. This precaution is especially desirable where patient has to be transported by train any great distance from out on the line to hospital before what may be termed the second stage of treatment is commenced.

In case of a fracture the injured limb should be placed on a padded or covered splint and held by roller bandage as immovable as possible. The most comfortable appliance for fracture below the knee is an ordinary feather or cotton pillow held firmly around the limb by bandage or cord. This is also a good temporary dressing for such fractures in place of a fracture box or sand bags prior to the application of the permanent or final treatment by plaster of Paris.

The shock in these cases is due almost wholly to physical injury, and is manifested by cardiac depression and impairment of the respiratory and sensorial functions, and reduction of surface temperature. In some cases on first visit the patient is found with a weak, thready pulse, sometimes imperceptible at wrist, and the whole body surface cold and clammy.

While dangerous shock may exist without hemorrhage, railroad injuries are frequently associated with it, and loss of blood augments the danger as the vital forces are impaired. It is this class of cases, those complicated by loss of blood almost to exsanguination, where the normal salt solution used directly in a vein, has its quickest and most beneficial effect. I can speak positively of this, as I have used it in this way in several cases where to all appearances it was life saving. It is not always practicable at first visit —possibly made at night and in inclement weather on the road side, in the yard, or where facilities are inaccessible—for to make use of this restorative. The immediate work is to re-establish the functions of the heart when this organ shows dangerous weakness from shock with or without hemorrhage, and to convey the patient as speedily an dsafely as possible to his home or preferably to a hospital for operation, as the case demands.

For supporting heart action the hypodermic administration of strychnia, nitroglycerin or digitalis are the remedies of the hypodermic case carried by most railroad surgeons and doctors for immediate use in emergency cases requiring heart stimulation.

Adrenalin chloride is the latest. It is claimed for this remedy that it is the most powerful styptic and heart stimulant known. My experience with it is as yet too limited in cases of shock to speak from experience, though I have used it in some minor surgical cases satisfactorily as a styptic, and combined with cocaine as a local anesthetic.

Prof. George W. Crile, Cleveland, Ohio, asserts that strychnia, nitroglycerin, digitalis, etc., are of no value in the treatment of shock or blood pressure, nor is alcohol; that these remedies so universally used by the profession in cases of heart depression or weak pulse for some years past, are contra-indicated in shock due to depression of the vasomotor system.

To combat shock it has been my practice as soon as the patient can be placed in bed at home or hospital to apply rubber bags or bottles of hot water next to him and use such other means as thought best at the time to assist in restoring the normal body temperature.

In the majority of cases of railroad injuries the principles of minor surgery are applicable and require no special comment here. Though all cases should be carefully investigated as sometimes apparently trivial injuries are followed by serious consequences.

INITIAL REPORT.

Coincident with the professional duties of the first visit comes the official duty of making a report of all cases of injury directly to the Chief Surgeon. Through this medium the company surgeons and company attorneys are most frequently brought together in their official relations.

This report follows a prescribed form, the main features of which are as to place, date and how the accident occurred as stated by the patient, character of injuries, what services were rendered at first visit, etc.

I am surgeon of two systems, the I. C. R. R. and the Southern Railway. The former requires the signatures of two witnesses to the statement made by the patient, and the Southern requires the names of one or more witnesses to the accident.

Company attorneys and claim agents in getting evidence as to responsibility and other questions connected with these cases, find this part of the report very useful, as it facilitates their work in making final settlements.

Two important points in a report are accuracy of diagnosis and opinion as to period and extent of disability. For example, severe concussion of the brain or spinal cord, or both, are not likely to be overlooked at first visit, and when they do occur are not necessarily followed by permanent disability. But what at first may be considered by both patient and surgeon a slight and transitory injury may develop into serious physical or mental disability. Out of this class of injuries, those affecting the nervous system have arisen some of the most difficult questions to settle in a medico-legal sense.

To treat of these questions and injuries beyond a mere mention would exceed the proper limits of this paper.

For interesting literature on this subject I refer to "Concussion of the Spine, Nervous Shock, etc.," by Jno. E. Erichsen, and "Injuries to the Spine and Spinal Cord" by Herbert W. Page. There are doubtless later books on this subject, but these are not very old and are very good. In an appendix to his book Dr. Page gives a list of 234 cases covering a variety of this class of cases, both as to pathology and in a legal sense, as many of them were the subject of litigation for damages.

All surgeons at important points, that is where these cases mostly occur, should be supplied with a book or bound copies of these blank reports, in which they can keep an exact record for reference. This is done by the I. C. R. R., and is found very useful for reference, not only for the above-named purpose, but for making certificates for indemnity against accident insurance companies and other purposes.

(DISCUSSION OF PAPER BY DR. THORNTON.)

DR. C. P. GORDON, of Dalton, Ga.: There is one point I desire to refer to, and that is in reference to injury to the spinal cord. Thanks to Mr. Erickson, the railway spine has cost the railway companies hundreds of thousands of dollars. Every nervous man who is in a railway wreck, it matters not how slight, the shock is sufficient to make him think his spine is injured. The spinal cord is protected by the bony covering of the spinal column, and it takes force, direct and violent, to produce injury to that cord. A very slight injury and shock does not produce injury to the spinal cord. When we come before the courts of the country in these damage suits, and when we do not find evidence of injury, and the tendon reflexes are normal, I say that we ought to have the courage of our convictions and stand up before the courts and juries and say that the railway spine does not exist.

Dr. R. S. Toombs, of Greenville, Miss.: At the risk of appearing too often before you, I wish to state that I think this paper by Dr. Thornton is replete with practical ideas, and I want to endorse his ideas about primary attention. I will be excused for saying that I do not believe that railway surgery is as perfect on that point as it should be. We know that upon this primary treatment much depends as to the condition of the patient when we reach him. I believe, and have suggested to our President, that we should take up the question of the importance of directing a special line of instructions to the operators. The treatment during the first few hours before the surgeon gets there is often dangerous, as all sorts of material is put into the wound and sepsis often results. I believe that the through train which leaves the station should have a package upon it with instructions to govern the crew in case of accident. Not long since a man was brought to me with a wound of the femoral artery and no one knew how to place a ligature to save his life. A surgeon in New Orleans said that any man could put the bung in a barrel to stop the whiskey from running out, but no man knew how to stop a man from bleeding to death.

Dr. G. M. Burdett, Lenoir City, Tenn.: I rise simply to make one suggestion on Dr. Thornton's paper. He gave a number of remedies to be used in case of shock. I think he omitted the most important one, and that is hypodermic injections of sulphuric ether. If injected promptly it will relieve shock more than anything else. I have used as much as half a syringe full with excellent results.

Dr. B. B. Simms, Talladegga, Ala.: I want to say a word about shock. I have often used strychnine and digitalis, and, I think, with success, and I dislike to do without these drugs; also nitroglycerine. Caffeine is also good in shock.

As to "railway spine," I had a case a few days ago. I was called to see a boy, bruised about the chest, and I did not think he was hurt very much. I went to see him twice, and after four weeks he came into my office. I could not find anything wrong, but I took the precaution to have a doctor next to me to look over him. He also pronounced him well and all right. He went to Birmingham, and two osteopaths heard of the injury and told him that if he did not get the bones replaced he would never get well. They sent him a bill for $150.00. I had already sent in a final report that the boy was well. Thus it is a good thing to have some one else to see these cases with you.

Dr. S. G. C. Pinckney, of Atlanta, Ga.: I want to call attention to one drug that I use a great deal, and that is caffeine. It can be given hypodermically in grain doses and is of great value in cases of shock.

Dr. Pruett, Grand Junction, Tenn.: I would like to ask if any of the doctors have had any experience in the use of the aromatic spirits of ammonia in cases of shock? I think I have had successful results from its use.

Dr. W. C. Connally, of Dallas, Ga.: I think these drugs are dependent upon the alcohol that is in them for their effect in cases of shock.

Dr. G. B. Thornton, of Memphis, Tenn. (in closing): I am obliged to the gentlemen for their discussion of this paper, and trust it may lead to a better understanding of the true pathological conditions of shock from traumatic injuries, and to more prompt and better remedies.

If the views of Dr. Crile, published in the Boston Medical and Surgical Journal about two years ago, are correct, we have yet a deal to learn as to the best methods of treating shock. We must discard the use of strychnia, nitroglycerine, digitalis, alcohol, etc., and use the adrenaline chloride, with or without the normal salt solution; this latter is best indicated when there is weakness from loss of blood.

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THE PREVENTION OF HERNIA FOLLOWING ABDOMINAL SECTION—THE IMMEDIATE SECONDARY OPERATION IN DRAINAGE CASES.*

By R. L. Payne, M.D., Norfolk, Va.
Gynecologist St. Vincent Hospital; Medical Director Jamestown Exposition.

The admirable structure of the abdominal wall for the preservation and comfort of the contained organs cannot fail to impress the student of anatomy. The strong muscular envelopes made up of layers crossing each other in different directions, the heavy, fibrous aponeurosis with interlacing fibres at each point of junction, as in the linea alba, make up a wall at once capable of distention to remarkable degree and yet one so constructed that, no matter what the degree of distention, the pressure is equalized in all directions.

And so it happens that hernia of any of the abdominal contents is very rare except at the umbilicus or the abdominal rings. As soon as any of these structures are divided, however, the whole condition is changed. The interlacing fibres can rarely be united in exactly the old order, and if, as so often happens, the wound must be left open for drainage and is only healed by a broad poorly organized scar tissue, then under the every day strain of abdominal pressure a hernia is almost sure to result. It follows, therefore, that every effort must be made to prevent the occurrence of hernia following abdominal section, and it is equally certain that no matter how painstaking our efforts they will oft times result in failure. The following rules if followed carefully will give the largest percentage of success in clean operations:

1st. Always make the incision along the line of the muscle rather than in the tendinous lines.

2d. Never cut the muscles, but separate the fibres with the handle of the knife.

3d. Suture the wound in layers, making careful approximation of like tissues and paying special attention to the closing of the aponeurosis, since in this lies the greatest strength of the abdominal wall.

4th. Be exceedingly careful of the hemostasis and of not leaving dead spaces in the wound, for no matter how much you may try *there is no absolute asepsis*, and the bloodclot in the dead space affords the most favorable culture medium for the growth of germs, and suppuration in the wound weakens permanently the abdominal wall.

These are well established rules of procedure, and if followed strictly will usually suffice to prevent hernia, but in that large class of cases in which drainage must be resorted to—suppurative appendicitis being the most common type—no such safe-guards can be used and the resulting hernias are very numerous. For some time now the writer has employed the following method in these cases with very gratifying results:

Let us suppose a case of suppurating appendicitis, drained and walled off in the usual manner with gauze. The packing is renewed from day to day until at length the wound is filled in with granulations up to the level of the muscles of the belly wall. The granulations are healthy and the wound is to all intents and purposes clean.

The patient is etherized, the surrounding skin made as clean as possible, and the whole surface of the granulating wound dried with sponges and mopped over thoroughly with pure carbolic acid to render it as aseptic as possible. An incision is now made outside of the scar-tissue just beyond the limits of the original wound, and this incision is carried down through the aponeurosis into healthy muscular tissue. The scar tissue and the granulation tissue are then dissected out with great care in one piece. The greatest caution is exercised to avoid cutting through the peritoneum on the one hand for fear of infecting that cavity, and equally great care to avoid cutting through the granulations from below, so that the bottom of the wound may be perfectly clean. Having finished the dissection, the edges of the aponeurosis and of the skin are freed by a few touches of the knife. The wound is now sutured with interrupted sutures of silkworm gut, being careful to include the aponeurosis in each suture and to use a sufficient number of stitches to close the wound accurately. I have now used this method in twelve cases and in each have obtained primary union. In one case, several weeks after apparently good union had taken place, suppuration occurred and the wound had to be reopened, but in none of the others have I had the least trouble. Several of these immediate secondary operations have now stood the test of two years, and in none of the cases has hernia resulted.

I do not know that any other operator has used this method, but to my mind it is worthy of further trial.[†] 1st, Because it certainly hastens the healing of the wound and saves the patient many days in bed. 2d, It results in a linear scar instead of the broad, unsightly healing of the granulating wound. 3d, It is the best preventive we yet know of hernia in this class of cases. I am aware that the operation would be more perfect did we dare open the peritoneum, separate bowel adhesions and close the wound as in an ordinary operation for ventral hernia, but I have been afraid of infecting the general peritoneal cavity, and the results have so far been too satisfactory by the method I have outlined to justify the taking of so great a risk.

[†] The simplicity of the idea leads me to believe it may have been advocated already and if so I make no claim to priority, but after careful search of the available literature I am unable to find this method advised.

The use of abdominal bandages, supporters and trusses for the prevention of hernia after abdominal operations I believe to be absolutely useless. I have never seen an abdominal bandage or supporter that seemed to me to actually sustain the weak point in the abdominal wall, and so for several years past I have entirely abandoned their use. Instead of these when the patient is ready to rise from bed the line of the wound is carefully supported by zinc oxide adhesive plaster applied in criss-cross fashion, and these straps, renewed as occasion demands, are worn for several months. The plaster sticking closely to the skin affords much better support to the wound than any abdominal bandage and for your poorer patients eliminates an unnecessary expense.

In closing this paper, I wish to say just a word as to the time patients should remain in bed after abdominal section. I believe the tendency now is to hurry the patient too quickly out of bed and thus to increase the danger of hernia. I always insist on three weeks' recumbency, and if the incision be extensive, as for the removal of large tumors, four weeks is short enough time. No matter how quick the healing, the line of union is made up of poorly organized tissue at first, and it is a great mistake to subject such tissue to any strain that can possibly be avoided. A week too long in bed is often the best safeguard the patient can have against post-operative hernia.

(Discussion of Paper by Dr. R. L. Payne.)

Dr. S. R. Miller, of Knoxville, Tenn.: I cannot add anything to the paper. Certainly everything the Doctor has said seems to me all right. I have not tried it just as he has done it. I have used sutures of silk worm gut, but not through the peritoneum. As I said before, I think the Doctor's description is very clear, and is certain worthy of a trial. When I have a suitable case I will try it.

Dr. G. A. Baxter, of Chattanooga, Tenn.: The Doctor's method cannot be criticized. I approve every step that he takes.

I want to call attention, however, to a new method that came to my mind in regard to closing abdominal wounds, as it is a good thing, but not original. Dr. Matas, of New Orleans, was struck by the wide divergence of sutures as he closed the lower tissues. As the Doctor has recorded it, he stated that you cannot make an absolutely dry wound, and this is necessary for proper healing, and therefore he takes advantage of these wide stitches in order to enable the serum to escape from the wound during healing. After he reached the skin and cellular tissue, he closed with narrow layers of adhesive plaster. He does this for the reason that there is no possible strain upon these outer tissues and you get the line of union complete. There is no need of constriction whatever, and you avoid in every case a stitch-hole abscess. It seemed to me a questionable procedure, and I asked to see some of his results. I saw two cases and there was a hair line of union that you could hardly detect. This struck me as a very great advance in the closure of abdominal wounds. He said that no matter how large the external wound he closed in this way. He used interrupted sutures beneath the surface at a distance of three-quarters of an inch. I mention this, as I think it is new to the profession.

Dr. Chaffee was called for: I would be afraid to place sutures so far apart as Dr. Baxter has suggested. In our work in New York we have been using what Dr. Wyeth calls "a wicker of gauze." We place this in the wound while the sutures are being put in place. : an assistant draws this away as the operator ties the sutures behind it. We always leave the wound in a dry condition. If your wound is dry, infection is not so likely to result. Germs cannot live in a desert. They must have moisture, and therefore we keep the wound as nearly dry as possible.

We are afraid of the adhesive strips, and they are not used very extensively.

Dr. R. L. Payne, of Norfolk, Va. (in closing): As to Dr. Matas' method, I think the position must be regarded as tentative, because while eliminating one source of danger, it opens up another, and that is, hernia. Unless the aponeurosis is closed accurately we are in great danger of hernia, and in the gap between the widely separated sutures you will not get good union, and therefore the method is bad. On the other hand, in the closure of the abdominal wounds there is dead space and hemorrhage is more likely to occur into the fat. But we can afford to close the aponeurosis thoroughly if the only thing is a fear of dead space if we leave plenty of opportunity for drainage from the cellular tissue. I operated only recently upon a woman with one and a half inches of abdominal fat. I tried to approximate thoroughly, but was afraid I would get infection, and therefore adopted the plan of laying a narrow piece of gauze along the line of the wound in the fascia and under the cellular tissue and bringing it out at the lower end of the wound. I did not get any infection or lengthen the time of the healing and I think it was a good thing.

BURNS AND THEIR TREATMENT.*

By AMRROSE McCOY, M.D., Jackson, Tenn.

Erichsen says that a burn is the result of the application of so great a degree of heat to the body as to produce either inflammation of the part to which it is applied, or charring and complete disorganization of its tissues, and that a scald is occasioned by the application of some hot fluid to the body, giving rise to the same destructive effects as are met with in burns, though differing from them in the appearance produced. From a pathological standpoint there is no difference between a burn and a scald. There are many different ways that railway employees may be accidentally burned, such as by escaping steam from the bursting of a steam-pipe, or from a valve or plug blowing out. In a collision I have known the fireman and the engineer to be pinioned against the boiler head and the fire-door. One is often caught and fastened under an overturned engine and scalded by the escaping steam and water. Pieces of red hot iron flying off from material that is being worked in the shops, and sometimes small pieces striking an employee in the eye, are very common causes of burns. The accident happens at times from explosion of gasoline and other inflammable materials.

Burns are of different degrees and extent. A very convenient classification is to divide them into three degrees, first, second and third. Burns of the first degree only produce hyperemia or redness of the skin. Those of the second degree are accompanied by the formation of blebs and blisters, while those of the third degree result in the charring of the parts and the formation of an eschar.

Whether superficial or deep, and regardless of the degree, a burn is always a painful, and it may be said, always a dangerous injury. Some one has very wisely stated that an injury to the head is never so severe but that the patient may recover, and that it is never so slight but that it may prove fatal. The same thing can be said of burns. In burns you have something more to deal with than simply the local traumatism. The pain is due largely to exposure to the air of so many sensitive nerve endings. The lesion is not only a painful one but is always slow to heal. It is followed in many instances by unsightly cicatrices, and sometimes by much deformity as the result of contracted tendons and muscles. These deformities are more likely to occur in certain regions than in others; namely, about the hand, wrist, elbow, popliteal space and neck. Severe burns are always accompanied by great shock to the nervous system. Where the blistering is extensive there is a very profuse discharge of serum. The amount of leakage and oozing from a blistered surface is much greater than it is usually thought to be. If we but watch, however, the frequent saturation of the dressings it is easy enough to form a correct idea of the great loss to the blood and general system. Certain changes are produced in the blood and as a result toxins are generated in it. The blood and tissues become as it were dehydrated. Serious derangement of internal organs often occurs. The most frequent internal complications are pneumonia, bronchitis, and ulcerative inflammation of the duodenum. There is suppressed or diminished action of the kidneys. Where the patient has inhaled hot steam we often find an inflamed condition of the upper air passages.

The patient who has received a severe burn suffers great pain. He is excited, restless, nervous and anxious. He walks the floor and is not disposed to either sit or lie down. He is chilly and shaky and his entire condition and expression are one of agony. It is no wonder that he begs that something be done to relieve his suffering.

Burns are dangerous in proportion to the amount of surface involved and not to their degree or depth. It has been claimed as a general rule that if one half of the body surface be affected, death will always follow, and that if one third or one fourth of the surface is involved death will result in the majority of cases. This is a good and reliable rule, but I am sure there are exceptions to it. I can now recall two cases that came under my own observation in which fully one half or more of the body surface was involved and in which recovery took place. Both cases were those of engineers who were fastened under engines that had been overturned in a collision. In one the burns were of the first and second degree, and produced altogether by escaping steam and water. In the other the burns represented the first, second and third degrees, and were caused by escaping steam and also by part of the body being held in contact with the boiler head of the engine for quite a while. On the other hand, it is astonishing sometimes how fatal a comparatively slight burn may be. Twice have I had this indelibly impressed on my mind. I now recall a fatal case in a child five years old, in which there was a burn not larger than the palm of my hand. It was situated over the epigastrium. Another case was that of a healthy man, who succumbed to a burn on the chest wall not larger than my two palms. This burn was situated on the anterior chest wall not quite directly over the heart.

It is yet an unsettled question as to how death is brought about by burns. They are more fatal in children than in adults, and those about the head and face are more dangerous than those on the lower extremities.

The very first thing to be done in the treatment of burns is to relieve the pain. There is no condition the surgeon is called to treat that requires more prompt and thorough action. To relieve suffering there is nothing that will answer the purpose like morphia administered hypodermatically. It should be given in full doses and repeated as often as necessary to allay the pain. Morphia not only relieves the pain but also the nervousness, the restlessness, and the excitement of the patient. If the shock be great we must in many cases give whiskey, aromatic spirits of ammonia and surround the patient with bags of hot water. If the temperature be subnormal and the heart weak, hypodermics of strychnia and nitroglycerin often times do good.

Before any local application is made the injured surfaces should be most thoroughly cleansed. For this purpose I know of nothing better than soap and water. The surface around the burn should be scrubbed with tincture of green soap and hot water, but over the burned area it should be applied very lightly. Hydrogen peroxide in some cases acts well as a cleansing agent. All blebs and blisters should be opened and the water and serum allowed to escape. Hanging shreds and fragments of skin and tissue should be picked away with the forceps, or cut away with the scissors when necessary. It is essential that the parts should be bathed freely with a weak solution of bichloride of mercury, carbolic acid or boric acid before the fixed dressing is applied.

There are a great many local applications used in the treatment of burns. In the first application the object to be accomplished is to exclude the air as completely as possible. Liniment of linseed oil and lime water has been used from time immemorial and oftener probably than any other one form of treatment. It is still employed and relied upon by some of our best surgeons, but is not so much in favor now as in former years. It relieves pain very promptly and very effectually, for which the sufferer is always extremely grateful. It is not, however, a cleanly dressing and is difficult to remove when once applied and allowed to dry. Another objection is the tendency to suppuration afterwards. White lead, bicarbonate of soda, flour, molasses, starch, bismuth, vaseline and many other substances have been used and recommended by different authors. In burns of the first and second degree good results will follow the application of picric acid. Gauze saturated with a solution of this acid is applied carefully and smoothly to the injured surface; over the gauze a layer of absorbent cotton is placed, and over this a roller bandage is applied not too firmly. This application relieves pain, acts as a decided antiseptic, and is not followed by much suppuration. It is a cleanly dressing and is not difficult to remove. The deep yellow stains produced by the acid can be removed by the application of alcohol. The dressing which in my hands has seemed the best of all is carbolic acid and glycerine in varying proportions. One part of carbolic acid to three, four, or five parts of glycerine is the strength usually employed. Strips of gauze are saturated in the mixture and applied carefully to the raw surface, care being taken to fit the strips closely around the flexures of the joints and the uneven surfaces of the body. Over this place the cotton batting and the roller bandage, as mentioned before. This application acts as a local anesthetic and relieves the pain almost instantly. It is a decided antiseptic, is easily removed, and one which is very satisfactory to the patient.

The treatment already mentioned is applicable to the first few days of the injury. Later there is more tendency to suppuration, and after the acute symptoms have passed off resort must be had to other means. The ulcerating wound is now to be treated on general principles. The treatment should be directed to secure the most rapid formation of granulation tissue and healing of the wound as quickly as possible. In this stage various ointments are of service. Carbolic salve, ointments of iodoform and aristol, or of oxide of zinc, all can be used to aid in the healing process. Some prefer a dry dressing and resort to different kinds of powders dusted over the burned surface. No one dressing and no one treatment is applicable to all cases. So we must adapt our measures to the condition of the lesion and to the peculiarities of the patient, if necessary.

In severe burns about the hand and wrist care must be taken that no deformity occurs as a result of contracting tendons. This can be prevented by the proper application of flat splints. Some of the ready-made, light, adjustable splints answer the purpose here very well indeed. The same precaution should also be taken with burns about the knee and elbow-joints and also about .the neck. In those cases of long duration and those slow to heal, and where the skin has been destroyed over a large area, we will often have to resort to skin grafting before the wound will heal. This can be done by Thiersch's method and by transplanting large strips of skin on the raw surface, or numerous small grafts of skin may be planted thickly over the area to be covered. One of the best applications at this time is bovinine. It more than any other application stimulates healthy granulation and aids in the formation of new skin and the process of cicatrization. A piece of sterilized gauze is saturated with bovinine, and this is applied smoothly and snugly to the ulcerated surface; over this is laid a piece of oiled silk large enough to cover the gauze, and over all a roller bandage is firmly applied.

Most authorities on the treatment of burns advise that the dressings should not be often changed, recommending that they remain on for as long a time as three, four or five days. I must confess that I have never been able to follow these directions. In my experience I have had to dress burns as often or oftener in fact than lesions produced in other ways. In the earlier stages there is a free discharge of serum that keeps the dressings saturated. In the later stages there is often a very free discharge of pus. Both of these conditions would require a frequent change of dressings. In the burns that I have been called on to treat, it has been necessary to re-dress daily or twice daily.

In the beginning of this paper I spoke of the altered condition of the blood and the derangement of the renal secretions following severe burns. No doubt death often occurs from the latter cause alone, the patients presenting symptoms very much resembling those of uremia. In this condition I have seen good results follow the subcutaneous injection of salt solution. This has the effect of supplying water to the dehydrated blood and tissues, raises the blood pressure, restores to a great extent the action of the kidneys and thereby frees the blood of toxins. Water and liquids should be given freely.

(DISCUSSION OF PAPER BY DR. McCOY.)

DR. T. P. SATTERWHITE, of Louisville, Ky.: I treat my burns entirely different probably from the majority of persons. I have an apparatus that if it is an arm or hand I immerse it in water and keep it there night and day. The pain is instantaneously relieved. I have an oil stove under this apparatus, or vessel, holding the water, and the nurse keeps that water at the proper temperature. You may talk of cleansing a burn as being very essential, but that necessitates chloroforming the patient, and I do not consider any anaesthetic safe. By my method you can relieve the pain and disinfect the parts. The treatment goes on continuously. We have a vessel with a stopper and two or three times daily we change the water. The limb rests upon a strip of thin gauze, so that it will float around in the water. Where suppuration is present then the water has to be changed often. Remaining in the water does not produce any harm. I remember reporting to this association a few years ago the case of a man who lived in a bath-tub for seven years, only getting out to attend to the wants of nature. He could not live outside of a bath-tub. This treatment of burns I have been using for some years, and it is something that gives most ease and comfort to the patient. You simply keep the water at the proper temperature, and change when necessary. The temperature is blood heat, or whatever is most agreeable to the patient.

DR. S. R. MILLER, of Knoxville, Tenn.: I don't want to let a paper like this pass without discussion, because this is a class of cases with which the surgeon must work right away. I am glad he gave Morton's classification of the three degrees. I make reports of the first, second, or third degree, and then I wonder what the officials of the road know about the different degrees of burns, and you cannot go into a description in the short space that we have on the report.

There is one idea that the Doctor advanced in his paper, I believe he did not mean to convey the idea that I got. That was, that the extent of the surface involved has more to do with the result, and that depth and location are unimportant factors in these burns. The depth should also be considered carefully in making a prognosis in these cases.

There is one feature of these cases that is interesting to me, and that is the pain. Some of the most serious cases have had the least pain. On the other hand some of the most trivial cases have the greatest amount of pain. It is a very interesting question that any one would be interested in studying out. There is very great variation of opinion on this point.

The Doctor reported using carbolic acid and glycerine 1 per cent. to 5 per cent. I would be glad to know to what extent he uses this in burns of the second degree. I would be very careful in using 1-20 carbolic acid. Dr. Eddy used to suggest that we use pure carbolic acid. I believe that this would not be so dangerous as 1 per cent. to 5 per cent. that the Doctor has mentioned.

I believe we can relieve the pain as well otherwise as with carron oil, which is certainly not a surgical dressing.

I would be glad to have the Doctor bring out the point regarding the use of the carbolic acid.

DR. W. C. CONNALLY, of Dallas, Ga.: I want to tell an experience that I had with a burn. I have treated burns for thirty years or more. An engine turned over and poured boiling water over a man. He was covered with the water and his arm and cheek contained the only skin that preserved its natural condition. When we pulled him out of the water the cuticle slipped off. I took him in hand and made him a skin. I commenced with one foot and then the other foot, and so on, using plenty of syrup and flour and cotton and cloth, and with those four things I made him a skin and he lived four days. There is one principle involved that I don't think any one has mentioned. The rule is that where one third of the surface of the body has a burn of the first or second degree, death is the rule. I expected this man to die, and, of course, he did. I have noticed in trivial and severe burns of the second degree that the length of the chill is a good index of what is coming. That man had a chill for an hour and a half before any reaction I was stimulating and working with him, and after a while he got hot, and he was hot, and he died.

Dr. W. C. Day, of Danville, Va.: I once before took issue with Dr. Miller about carron oil. Why can't you have aseptic oil? Why can't you boil your oil? I had a man who had his chest and arms burned, and I prepared the oil and added a few drops of creosote, and you have no idea how it will relieve the painful condition. I took gauze and soaked it in this oil and kept his arms wrapped and put oiled silk over it and this kept it moist and they healed without any bad results. Absorbent cotton was put over the oiled silk.

Dr. W. W. Reynolds, Meridian, Miss.: There are two questions that I would like to ask in regard to treatment of burns. It is a very important subject to me. First, in the use of glycerine in the treatment, we know that there is always a good deal of exudation, and would this not increase it and cause too much exudation? Second, as to the use of oil and lime water; I saw two cases that if the dressing had not been removed there would have been spontaneous combustion. Is it wise to use this?

Dr. R. L. Payne, of Norfolk, Va.: As to the point that Dr. Miller raised, that extensive burns produce no pain; the reason we have no pain is that the burn is so deep that the nerve endings are destroyed, and I think this is the only explanation.

As to the applications to the burn, it matters not what is used first if it be clean and excludes the air, and the suggestion of Dr. Satterwhite that we immerse in water I think is a good one where it can be applied.

In regard to carron oil I think it is to be condemned. It is not cleanly and there are so many other things that can be used that are just as good. I would also object to the use of glycerine and carbolic acid. Pure carbolic acid, as Dr. Miller stated, would be better applied to the wound. I think, also, the glycerine is objectionable. It dries the tissues and would make the burn more painful but for the carbolic acid.

Dr. F. E. Baldridge, Huntsville, Ala.: I would like to have some one explain why we have that peculiar exaggerated pain in burns. Also, where we have a slight scorching of the skin over a great extent they almost invariably die. I have read about this a great deal but am not satisfied about it.

I differ with the Doctor that the nerve endings are destroyed, and therefore cannot feel pain. The most painful burns are those of limited extent and superficial burns.

Dr. S. G. C. Pinckney, of Atlanta, Ga.: Death from burns is frequently due to shutting up the pores of the skin. We must remember that this closing of the pores will cause auto-intoxication. This will prevent excretion and the person will die of self poisoning.

For the relief of the pain I employ a solution of bicarbonate of soda, and I find this very-effective.

Dr. Thos. H. Hancock, of Atlanta, Ga.: I would like to confirm what the Doctor has just said about the use of bicarbonate of soda paste to control the pain. It is a good thing and after that I apply boracic acid ointment smeared on aseptic gauze.

Dr. H. T. Bahnson, Winston-Salem, N. C.: In this connecton I want to utter a word of warning against the too liberal use of picric acid. It is probably the most grateful application to burns, but it is after all, a derivative of phenol, and equally susceptible to absorption. I am sure I have seen evidences of carbolic acid poisoning (inky black urine, etc.), from its use, in the form 5 per cent. or 10 per cent. picric acid gauze.

Dr. C. P. Martin, Woodstock, Ala.: I want to condemn the treatment of burns with any oil.

I differ with the Doctor in regard to picric acid, as I think it is a good thing.

We have tried oil and we could tell how the patient was getting along by the odor we had. Following oil we had a horrible sepsis. I would not use carbolic acid in the treatment. In burns of the second and third degree our rule is to use one drachm of picric acid to the pint. By using that solution we rarely have to use morphine to quiet the patient. Before you get one limb dressed with picric acid your patient will be resting well, and by the time you get the other leg dressed the patient would be free from pain. Following this we dress daily with boracic acid. We rarely ever have a scar following this.

Dr. S. R. Miller, of Knoxville, Tenn.: I want to endorse what has been said about picric acid. I have used it for five years. If I am burned seriously I am going to have myself put in a bath, and I wish to have it a solution of picric acid and stay there a week.

As to the carron oil, I do not see how it can be rendered aseptic, you cannot boil it, and you cannot very well sterilize the lime water.

Dr. Ambrose McCoy, of Jackson, Tenn. (in closing): I am very thankful for the expression that has been given. I am satisfied that the people who are burned in this country will have no trouble in being treated.

The treatment of Dr. Satterwhite in water, no doubt, is a good one and very agreeable to the patient, but every case cannot be treated this way.

What I meant by the danger depending upon the surface involved is this: a burn of the first degree over the entire body is more dangerous than a burn of less extent of the third degree. Of course, a burn of the third degree involving the same amount of surface would be more dangerous than a burn of the first degree.

As to the carbolic acid and glycerine, I have never seen any bad effects from the absorption of the acid. Take a subject that has been subjected to intense heat and the absorptive powers are not very great.

Also, in regard to the glycerine producing a watery flow, that is what it does and what we want it to do. As I stated in the paper, the secretions of the kidneys are stopped, and the glycerine helps to eliminate these products and acts as a safety valve.

So far as the pain is concerned, I never saw a patient that did not complain of the pain, unless it was so great as to produce rapid death of the patient.

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TREATMENT OF BURNS AND SCALDS.

By E. M. MAGRUDER, M. D., Charlottesville, Virginia.

The frequency of burns and scalds in railway surgery and the suffering experienced by the patient during the time of treatment, are sufficient excuse for the presentation of this paper.

The burns and scalds encountered in railway surgery occur principally among the employes of the company, such as engineers, firemen, conductors, brakemen and workmen in the shops of the company; more rarely are passengers the victims. In an experience of nearly five years as railway surgeon I do not recall the treatment by me of a single passenger for either of these injuries.

Railway employes are, as a rule, men in the prime of life, of sober habits, of good physique, and free from constitutional disease—hence they make good patients and recover rapidly when injured and placed under favorable conditions. They are likewise almost invariably men of pluck and endure pain and discomfort remarkably well and patiently.

The prognosis depends more upon the extent of surface involved than upon the depth of the injury. In my opinion, an involvement of one-fourth of the surface of the body places the patient in jeopardy of his life, though we may look for a large percentage of cures; any increase over this extent of injury seriously augments the danger, and when it reaches one-half of the body surface a fatal result may confidently be looked for, although even under these circumstances recovery has been reported—but what a life in prospect!

When death occurs it is due either to shock, sepsis, or to that more or less hypothetical condition, duodenal ulcer, of which all of us hear but which very few ever see.

In considering the treatment I see no necessity for the division of these injuries into the so-called "degrees" of authors and I will not attempt it.

The chief features of these lesions are:—

(1) They generally involve a large surface;

(2) They generally have a large amount of foreign matter, as dirt, cinders, engine grease. etc., ground into them; hence they are all in the nature of infected wounds.

The principle obstacles met with in treatment are:—

(1) The difficulty of making the patient comfortable at once and keeping him so during the reparative process;

(2) The difficulty of properly cleansing the lesion and keeping it clean, on account of the pain accompanying the act.

The indications for treatment are:—

(1) Relieve pain;

(2) Combat shock;

(3) Cleanse the lesion and keep it clean.

The pain and suffering accompanying a burn or scald are excruciating and often out of proportion to the extent of the injury, and a hypodermic dose of morphine, without atropine,.should be given at once, then something should be done to prevent the contact of air with the injured part. (The manner of doing this will be described later on.)

The shock attending an extensive burn or scald is often profound and it is frequently a factor to be reckoned within injuries of moderate severity.

In the treatment of shock it is claimed that the best results are obtained by following the recommendations of Crile, who has recently been investigating this condition: these are based upon the assumption that in shock it is not the heart that is at fault, but the vaso-motor centre, which is in a state of depression and exhaustion, and that the consequent lowering of vascular tension is responsible for the alarming symptoms that follow. The following treatment is indicated as the result of this investigator's researches and it seems most rational and practicable:

(1) Hypodermic Morphine to restore nervous equilibrium which has been interfered with or destroyed;

(2) Compression, by means of bandages (I would suggest over sheet wadding) applied to all the sound parts of the trunk and extremities, the object being to give support to the relaxed blood vessels;

(3) Injection of Normal Salt Solution, warm, about one quart, into a vein, the purpose being to raise bascular tone by filling the the relaxed and dilated vascular system.

Strychnine and Digitalin, on account of their effect in raising blood pressure, may be used; in cases of great severity, however, Crile found them of no benefit, though in mild cases they seemed to be of some service. Atropine, nitroglycerine and alcohol are positively condemned by this observer, probably because they lower arterial tension!

As soon as reaction from shock has advanced sufficiently the injury should be cleansed as thoroughly as possible; this operation is, of course, usually extremely painful, and it is often necessary to use an anaesthetic, which I urgently advise. As before stated, all burns and scalds are really infected wounds, and they should be so treated. The injured parts should be gently and carefully washed with warm sterile water and some mild sterile soap, all foreign matter being removed and loose necrosed skin clipped, the whole surface should now be rinsed with warm sterile normal salt solution (42 grains to the pint, or 6 per cent.; Crile advises 9 per cent. or

63 grains to the pint). When the injured area is small a weak solution of bichloride of mercury (1 to 10,000 or 16,000) or boric acid solution (a teaspoonful to the pint) may be used, but they both cause too much pain to be used on extensive areas. After the parts have been rendered as nearly sterile as possible any vesicles or blebs that may be present should be evacuated by puncture with a sterile instrument and the uplifted skin allowed to fall back in place as a protection against irritation and infection. The parts should then be gently sponged with dry sterile gauze in order to remove any remaining moisture. The injury is now ready for the dressing, and upon the kind of dressing used will depend the future comfort of the patient.

There are three requisites for a dressing that is to be applied to a burn or scald:—

(1) The dressing should be sterile;
(2) It should be comfortable;
(3) It should be one that does not stick and easily removed without causing pain.

In the treatment of burns and scalds, making the patient comfortable is a "sine qua non," an absolute necessity, and is even more important than rendering the field of injury aseptic, though, of course, the latter should be aimed at; and, moreover, I am firmly of the opinion that these injuries cannot be treated comfortably wtihout the use of oleaginous preparations. There is always a profuse discharge, at first serous and in a few days sero-purulent, which saturates the dressings and, in drying, causes them to become harsh and to stick, especially around the edges, rendering removal extremely painful and exhausting. Now the use of oily preparations with gauze and cotton obviates this to a certain extent; but, when the discharge is very profuse or the dressing happens to be left on longer than it was intended, the oily preparation may be absorbed by the cotton or washed off by the discharge, the drying process again occurs and the dressing sticks causing torture to the patient when it is removed. The best method of dressing these lesions that I have ever employed is the following:—

There is now on the market a preparation, proprietary no doubt, called "Emoleo," which is a mixture of zinc stearate and olive oil, having the appearance of a thick white emulsion that flows with difficulty from a bottle. It is claimed that it is sterile and my experience seems to verify the claim. "Emoleo" is freely poured over the whole of the injured surface and over the adjacent sound skin for two or three inches around; it is pleasant, bland, non-irritating, and grateful to the patient. The whole of the "emoleoized" surface is then covered with a sheet of rubber tissue or oiled silk, made sterile by soaking in a solution of bichloride of mercury or formalin and then wiped dry with a sterile towel. Over this protective covering, which should have slits cut in it for drainage, sterile gauze and cotton or cotton alone is placed, and the whole retained by a roller bandage.

In cases with exposure of much raw surface there is always more or less suppuration, and the dressings should be renewed at least once daily or oftener, as occasion may require; later on, as the discharge diminishes in amount, it may be done less frequently.

The air tight covering of rubber or oiled silk is non-absorbent, allows little drying, and keeps the parts underneath moist, hence there is no sticking to the raw surface or skin, and the whole dressing peals off without difficulty and painlessly as soon as the bandage is removed.

It may be urged as an objection that the water-tight covering causes an accumulation of discharge under it and on the raw surface, but this has not been my experience; the discharge flows under the edges of the covering and through the drainage slits and is absorbed by the cotton.

No powder of any kind should ever be put upon a freely discharging surface, as it leads to the formation of crusts, beneath which infective agents find a haven and culture medium; later on, when the discharge has almost ceased and the surface has become aseptic, powders are very useful and should be used; I prefer for this pure powdered talcum to all others, as it is non-irritating, drying, odorless, and painless.

In the old days a favorite dressing was "carron oil" (a mixture of equal parts of linseed oil and lime water) freely poured on the injured part and covered with cotton or soft rags held in place by a roller bandage. This made a very good, comfortable, dressing, and one that could be easily removed without pain. With the rise of antiseptic and aseptic surgery, however, it came into disrepute, when all dressings of a greasy nature were condemned as filthy, germ-entangling, non-sterile, and as rendering a wound difficult to keep clean—and likewise that, in spite of the oily nature of the mixture, the dressings would stick when the discharge was profuse. For my part, I see no reason why carron oil may not be rendered sterile and used with the protective covering and sterile gauze and cotton, and retained as a valuable agent in our armamentarium.

Picric acid, so highly recommended, I have tried only to abandon, on account of the smarting pain it causes and the staining of whatever it comes in contact with, the stains being difficult to remove.

The dressing of these injuries by simply dusting with some powder and applying gauze and cotton is too barbarous to be even considered in this connection; and the same may be said of such antiseptic washes as bichloride of mercury, carbolic acid, formalin, creolin, lysol, etc. I have known even boric acid solution to cause intense suffering. Later on, however, in the course of the treatment, after granulation has become well established, the injured parts lose their sensitiveness, and these latter washes may be used, if a more germicidal solution is needed.

ANGIOMA OF THE SCALP CURED BY BOILING WATER INJECTIONS.*

By B. G. COPELAND, M.D., Birmingham, Ala.

In 1900, Dr. John A. Wyeth, of New York City, experimented with paraffin, alcohol and boiling water with the object of producing the starvation of inoperable, non-malignant tumors. He recognized the difficulty of dealing with cirsoid aneurism or cavernous nævi. From this time cases which were formerly abandoned as hopeless were now cured by the simplest means.

The theory advanced was that boiling water would cook an egg, and therefore coagulate the albuminoids of the tissues. Practice proved the theory to be correct.

I do not care to enter into the minutiæ in relating the various pathological conditions in which the treatment with boiling water is indicated. A reprint from the *Journal of the American Medical Association*, of 1903, and a practical reproduction of this article in Bickham's Operative Surgery is the only literature on the subject with which I am familiar. I will state, however, that the treatment is applicable in fistulas, hemorrhoids, small aneurisms, granular capillary angiomata ("mother's mark"), and venous angiomata (cavernous nævi).

I will relate a case. On January 11, 1905, William D., aged 33, was referred to me by Dr. W. This patient had had a cirsoid aneurism covering the entire cranium since his birth. The pulsations from the occipital bone to the supraorbital region and neck were very annoying. On January 10, 1905, the scalp sloughed above the right ear over the parietal bone, which, of course, was followed by a very severe hemorrhage. Dr. W. had applied a compress and brought him to my infirmary. I ligated both external carotids and then dissected out the frontal and the external occipital veins, ligating the emissaries. This controlled the pulsation and the hemorrhage was checked; patient recovered and was very comfortable for a while.

There was a large sinus left in the right occipital region, and one leading from the left occipital and the left frontal downward into the neck and face, below the lobule of the ear, on the right side, down to the tragus.

On January 31, 1905, under aseptic precautions, boiling water was used. An Esmarch was first applied around the cranium, this idea being original upon my part. Five injections of the prescribed syringe-full were used. The skin blanched and the assistant was compelled several times to remove his finger from contact with the scalp on account of the heat. These injections were made directly into the sinuses. Several times I traced an emissary and asked those present to watch the course of the fluid. A white line would appear which was an evidence of complete destruction.

Several sloughs occurred as a result of this treatment and edema of the neck and face was well marked, but the treatment was followed by no pain and the recovery was complete, the patient leaving the infirmary within the week. There is at present no evidence that such a condition ever existed.

(DISCUSSION OF PAPER BY DR. COPELAND.)

DR. S. R. MILLER, of Knoxville, Tenn.: I have had no experience along this line, and only know of a couple of cases that were treated by this method. One case was an immense angioma of the entire ear and scalp behind the ear. The ear was four or five times the size of the other ear. Dr. Wyeth ligated the carotid on that side and applied the hot water injections, and the case was very much benefited. There was a loss of some portion of the ear.

My experience has been entirely surgical in these cases of angioma. One case involved the eyelid and extending up into the orbit. The result was a complete success. The operation done did not bring about the success, but I afterward used adrenalin, and now you cannot tell that there was anything of the kind there. It is the only case in which I have given the adrenalin a thorough test.

Dr. Anderson was waiting here for some time, but could not remain and he left with me the instrument he uses. The syringe is used with asbestos gloves because it is boiling hot. Dr. Wyeth is making one to be heated by electricity so that the water goes into the tissues boiling hot.

DR. W. M. CUNNINGHAM, Corona, Ala.: This case of Dr. Copeland has been quite an interesting one to me because the case has been under my observation, living about two miles from me. The treatment with the hot water seems to be entirely successful, except a small growth low down posteriorly. I was interested in the use of it because I did not understand from the amount of the growth how he could use so much hot water without doing some damage to the cranium. I did not understand what he said about that. If his paper has not brought that out I would be glad to have him explain how he keeps from damaging the skull and brain substance. His case is practically well except a small growth low down posteriorly.

DR. GEO. CHAFFEE, Brooklyn, N. Y.: I recall the case Dr. Miller has cited. It was a remarkable case and was sent back to Knoxville very much improved.

In regard to the formation of a slough, that is the result of using too much hot water. In some cases there is marked oedema. We cannot always account for the oedema which has taken place, but in some cases there is none at all.

There is one location where the hot water is not applicable, and that is near the eye. I would advise you to keep away from the eye with hot water. It is a common thing for Dr. Wyeth to have three or four cases at the clinic of babies with birth marks to be treated with hot water. He has a case now reaching from the nose to the eyelid, and he will not use hot water there. He will quilt it with silk thread saturated with tincture of iron and hopes to effect a cure with that form of treatment.

Dr. E. Denegre Martin, of New Orleans, La.: I have had one case in which this treatment was tried. The only thing that I wish to emphasize is that, as in the use of other remedies, as carbolic acid, it is necessary to be careful to avoid sloughing. The difficulty has been to keep the water hot enough. If it is not kept at the boiling point, you will have to repeat the operation several times. Possibly I could have done better with more experience. It is simply a question of coagulation, and there is no danger, except, as Dr. Chaffee has remarked, in regard to the use about the eye. The water does no harm and can be injected in small quantities.

Dr. B. G. Copeland, of Birmingham, Ala. (in closing): As to the oedema Dr. Chaffee speaks of, I believe that whenever it reaches below the hair line you will have oedema. Dr. Wyeth speaks of that and I have seen it in two cases.

As to the gloves, Dr. Wyeth uses plain kid gloves. He has been in the habit of drawing the water and using the alcohol flame to keep it boiling. When I use it I draw right out of a boiling receptacle, and I use asbestos gloves.

As to the sloughs, I would rather not see them, but when you take into consideration the relief you are going to give compared to the slough it is not to be considered.

In regard to the amount of water used, it is forced in until the tissues blanch and you have an idea you will get a slough from the compression. We cannot decide the amount in every case until we use it. Where precautions are taken to prevent any infection you will find good results, but in many cases there is a great amount of skin that you cannot clean. You use the same precautions as with an ordinary operation.

As to the eye, I understand how dangerous it would be to operate about the eye or scalp. By the use of the Esmarch the communications with the brain would be cut off.

You inject directly into the tumor, being careful not to go through to the bone. Inject the water until the tissues blanch, and then go to another point and repeat.

SPRAIN OF THE ANKLE.*

By C. I. PEGUES, M.D., Safford, Ala.

This is a well-worn subject and it is not with the idea of advancing any original opinions that this paper is presented, but instead I hope, if the topic is deemed worthy of discussion by the members of the Association, to receive some suggestions that may be of aid to me in treating this condition more satisfactorily in the future.

The definition of sprain generally given is that it is a wrenching of a joint resulting from undue violence and causing traumatism of ligaments, tendons, vessels and nerves, with possible temporary dislocation of heads of bones.

The causes of sprains are numerous, and it is useless to go into details. They may be summed up in a few words. Any undue strain or violence may produce this condition. The diagnosis of sprains is not difficult, if the characteristic signs are present—swelling, pain, partial loss of motion, deformity and ecchymoses. Dislocation of the ankle must of course be differentiated from this injury; as Stimson states, "dislocation of the ankle-joint is very rare," and in this condition we would have immobility and the characteristic deformity; also when the joint is put at rest there is no cessation of pain, as is generally the case in a sprain. Fracture of the lower end of the fibula often gives rise to symptoms similar to sprain of the ankle, but the existence of crepitus and the localized points of tenderness peculiar to this fracture will help to differentiate it.

The diagnosis of sprain of the ankle is much easier than the problem—what is the best method of treatment? We have to deal with a condition in which we find ecchymoses due to contusion of bloodvessels, swelling and partial deformity due to bruising of ligaments and tendons, and often intense pain from injured nerves.

Now as to treatment: This, of course, is to a large extent dependent upon the severity of the injury. The first indication is to allay pain, and for this purpose a great many remedies have been suggested. Hot water is frequently of great service. Let the patient place the foot in water as hot as can be borne for 15 or 20 minutes. This frequently affords temporary relief. It has been my experience that absolute rest of the joint is by far the most beneficial measure at our hands. A posterior splint applied from the middle of the leg downward accomplishes this nicely in the stage of swelling and pain. This splint can be easily prepared by taking an ordinary plaster-of-Paris bandage, spreading it in alternate layers of suitable length on a smooth surface and moistening it. It can then be perfectly moulded to the limb, and can be secured by strips of adhesive plaster or a few turns of a gauze bandage. This leaves the parts open for inspection, for massage, if indicated, and for any local applications that may be made. After the pain and swelling have subsided, the posterior splint may be replaced with a well-fitting plaster bandage. This should be as carefully applied as if we were dealing with a fracture or dislocation, or else we may get a deformity or possibly a weakened joint as a result.

The average patient does not attach sufficient importance to a sprain, and it is necessary to caution them in regard to walking too soon. And another point that can be made is that the majority of patients when recovering from a sprain think it is their duty invariably to wear a slipper or low shoe on the affected foot, but instead of this a well-fitting high shoe should always be worn after these injuries to preserve the integrity of the joint.

(DISCUSSION OF PAPER BY DR. PEGUES.)

DR. S. R. MILLER, of Knoxville, Tenn.: A real bad sprain is one of the most troublesome conditions with which we have to deal. Frequently a sprain is attended with injury to the arch of the foot, and in such cases I invariably use the plaster-of-Paris, or the starch bandage, and I do not let the patient use the foot at all. For a simple sprain I use the adhesive strips, and sometimes I get good results and then again it is a failure. I think a great deal depends upon just how you apply these adhesive strips. If we know just which ligaments are involved and understand the anatomy thoroughly then we can remedy the trouble with adhesive strips. Often we cannot tell whch ligaments are involved, and then we are in the dark as to how to apply these. A railway man cannot often give a clear history of the injury. We are often called to see a man who we are told is badly injured, but when we get there may find there is not much the matter with him. I remember one case where I was called out on Christmas Eve, a very bad night, and some miles from the station; and the man who called for me told me that he did not think the injured man had a bone in his body that was not broken. When I got there I could not find a broken bone anywhere. If we get reports like this, how can we expect to get a history that would give us an idea of which ligaments are involved. If we did know just which ligaments were ruptured then we could tell exactly how the adhesive strips should be applied. When we have extensive ones, and when the bones of the feet are involved and the ligament is partly pulled away from the bone to which it is attached, then the starch dressing is the best treatment.

DR. C. I. PEGUES, Safford, Ala. (in closing): I want to thank the gentlemen very much for the suggestions they have made. What I was after was information, and I have nothing further to add.

SHOCK AND ITS TREATMENT.

R. C. Smith, M.D., Newport, Tenn.

In the preparation of a short paper upon the subject of Shock I have been prompted by no idea of unfolding to the profession anything phenomenal in pathology or new and startling in therapeutic endeavor.

For years I have recognized the gravity of the condition and when led to a careful investigation of the subject, was amazed at the literature to be found on the subject.

This subject, perhaps, more properly falls under the section of surgery, and yet our most voluminous works upon surgery devote only two or three pages to the discussion of it.

Am I wrong, or unduly exercised, over a little matter? Many other subjects, to my mind of minor importance have consumed the time of our most profound investigators.

This, the Amazon on the highway to recovery, is overlooked or treated as a matter of little gravity.

It is a condition in which the vital forces are partially suspended—sometimes it appears as if they are almost totally arrested.

The causes of shock are either mental or physical blows at the nervous system, partially annuling the functions of the sympathetic nervous centers; and secondly, where the cause partially annuls the functions of the cerebro-spinal nervous centers, as well as the sympathetic.

The tone of the blood vessel is lost whenever the sympathetic nerve fails to invigorate the cardiac ganglia. Whenever the heart's action is very weak, the blood tends to accumulate in the veins.

There are many minutia that might be mentioned in this paper but, as previously intimated I desire to be intensely practical rather than theoretical.

The cause of shock might be divided into "predisposing and exciting." Under the first division we may, I think, consider fear as a dangerous factor.

If a major operation is set for a certain hour, and the patient presents any evidence of fear, or dread of the operation, or anesthetic, I think that every measure tending to reassure the patient should be practiced. A small amount of morphia, with atropia, a short time before the operation, in my judgment, is the best method to pursue in the great majority of cases.

Some of our cases are in a condition of collapse when we first see them. The effect of these drugs relieves the frightened condition of the patient and enables him to take the anesthetic better. And just here I want to advocate complete anesthesia in major operations.

Under this head comes a number of conditions that lead to impairment of vital energy or force: Uremia, lithemia, or nephritic disorders; the opium habit, drunkenness and insomnia.

The exciting causes of shock with which the surgeon has to deal are loss of blood, length of operation, excessive anesthesia and loss of heat.

Hemorrhage is by no means the only cause of shock, but is certainly the leading cause. We have profound shock without the loss of a drop of blood. I remember a case of extreme shock in a boy ten years old, produced by another boy, somewhat his senior, kicking him violently over the abdomen.

In the case of a strong, robust man without any appreciable lesions. The latter resisted all efforts at treatment and died in a few hours. Generally speaking, however, shock is in proportion to the extent of hemorrhage. This perhaps is not always true, but it is in a great majority of cases.

Now, as to the length of time of an operation:

I believe that much depends upon the length of time of the operation. Operations, in my opinion, should be made with all possible speed after careful and thorough preparation has been made.

Aseptic surgery is the only kind to be practiced or advocated, whenever and wherever it is possible to practice it. Rapidity next to asepsis will enable us to see fewer cases of shock and have the greatest number of patients to tell who made the operation.

I do not believe it necessary that the surgeon should be a demonstrator of anatomy, but he should have the highest veneration for a drop of blood.

We cannot tell how near the awful stillness of shock we are standing, or how well the most promising case will bear the anesthetic or undergo the operation.

ANESTHESIA.

This is indeed one of the most important steps in the course of the operation. A major surgical operation is enough with which to tax the vitality of any patient. Hence, we should be careful about the extent to which we carry the anesthesia.

Certainly we should anesthetize the patient, but we should not paralyze him. This invites the last cause mentioned of shock.

During continued and profound anesthesis, the temperature of the body falls, and sometimes falls rapidly.

How often do we say, and hear the operator say, put him to bed and cover him up; get some bottles of hot water and place around him?

This, in many instances, can be prevented if we will operate speedily and watch the limit of the anesthetic.

TREATMENT.

What shall we do for this condition? Here is a man who has lost by accident a large quantity of blood, or who has bled himself nearly to death by a dilatation of his own vascular structure, or if you please paralysis of the nerves that supply the blood vessels.

This may be as effectually done, in my opinoin, as if the common carotid was severed and left without attention. Position has much to do in these cases, in reference to the blood supply to both heart and brain; hence, I believe the head should be lowered and the foot of the bed elevated. This enables the flagging energies of a weak heart to more certainly get some blood supply into brain and heart.

Hot pack over pericardium is very valuable in arousing the sleeping energies of the heart, and this is accomplished by a rythmical contraction of the heart.

Transfusion is indeed another good way to fill the blood vessel, and this is just what we should do, and what we must do if a life is to be saved.

The filling of the blood currents with normal saline solution, or simply giving it subcutaneously in liberal quantities, is a valuable aid in the relief of these conditions.

I wish here to say a word about the temperature of the saline solution: It should be given at a temperature of at least 115 degrees F., or even better, at 118 or 120 degrees F.

Heat, we must remember, stimulates. I believe that great good may be accomplished by throwing a continuous current of normal salt water into the rectum or even in the colon, by means of a rectal tube.

To what agent can we turn with a feeling of receiving most benefit from its administration? We can give nitroglycerine, strophanthus and digitalis, in my judgment, with the assurance that we will not be disappointed. Prompt action is a potent argument in favor of their administration. When given subcutaneously, we have positive action from their use in about three minutes.

Indeed, I must not forget to mention that agent most generally employed by surgeons in the treatment of shock—strychnia-sulphate. More surgeons use this agent, perhaps, than any one remedy in the whole Materia Medica. From its proper use I have seen great good accomplished.

(DISCUSSION OF PAPER BY DR. SMITH.)

DR. G. B. THORNTON, of Memphis, Tenn.: The character of shock that we deal with mostly is from heavy traumatism, and it is to that class of cases that we are called upon most frequently to give relief. The cases mentioned in that paper were with and without hemorrhage, and where there is almost no pulse, with cold clammy perspiration, etc. In the recent literature the subject has had a great deal of discussion from the articles of Dr. Crile, of Cleveland, O. After a great many experiments upon dogs, where he created a condition of shock, in order to keep the heart acting he used adrenalin chloride 1-50,000 by transfusion-intravenous. I was so interested in this article that I ordered the journal in which it was published. The copy being misplaced I am unable to give its date. He asserts most positively that strychnine, nitroglycerine, digitalis, etc., which we have been relying upon, are injurious. Strychnine is universally used where the vaso-motor system is involved. I have recently read an article published by one of our local surgeons, Dr. Battle Malone, Memphis Medical Monthly, Oct., 1904, who had used the adrenalin chloride in normal salt solution with success in three or four cases. I have had occasion to use it once and satisfactorily since I have had knowledge of this treatment. This adrenalin has a wide range of usefulness.

As to the normal salt solution, I have had experience with it, and speak confidently, of its value to keep up a temporary heart action until it gets better support in cases where there is loss of blood. The intravenous use of the salt solution is the better way, as it is most rapid in effect. The slow subcutaneous injection is a good way, but the other is better. I have used it intravenously only to restore the volume of the circulating fluid, and it will bring up the pulse very promptly. In the case of a boy who was run over by a car wheel, and I amputated just above the knee on one side and just above the foot on the other, it was some hours before I saw the patient, and in that case I am satisfied that he would not have stood the operation without the use of the salt solution. He made a good recovery.

Dr. R. L. Payne, of Norfolk, Va.: I want to bring up one point in regard to use of the salt solution which results in harm, and that is the use of the salt solution as a restorative from shock in which there has been no hemorrhage. It has been overrated and in some instances is an agent of positive harm. I think I have seen death result from its use in a case of shock from which there had been no hemorrhage. In shock the function of the nerve centers is lost. If you increase the volume of the circulating fluid and the heart become overdistended, it fails because it cannot take care of the increased volume. I believe there is great danger in its use, unless the shock is accompanied by hemorrhage.

The only other use for salt solution is in cases of suppression of urine, because they have not taken in sufficient fluid and the kidneys lack the stimulus, and the normal salt solution will come in well in these cases.

Dr. W. C. Connally, of Dallas, Ga.: Dr. Payne has struck the bull's eye. There is no question about that. We have overlooked a great many important points in all these deliberations. Right there is an important point that has been overlooked, that is the differentiation of the causes of shock. Where there is loss of blood there is anaemia of the brain, and therefore more blood is essential. These points are always to be considered when we find a patient suffering from shock.

We will continue to use whiskey, nitro-glycerine, strychnine, etc., but I wish to illustrate another form of shock. I was called to see a man and found him lying on the floor partially conscious. I recognized some heart action. I found he had been bitten on the shoulder by a big spider. I thought that nitro-glycerine was indicated and I gave him a hypodermic of 1-100 or 1-150 and injected it over the precordia and in three minutes he wanted to sit up, and in ten minutes was sitting up, and that was all that I did for that man.

Dr. W. S. Wiatt, East St. Louis, Ill.: For our knowledge of the physiology of shock we are indebted to Dr. Crile. He demonstrated that the drugs which we are in the habit of giving for shock, viz.: digitalis, strychnine, etc., have no effect when administered to dogs suffering with shock. He also found that normal salt solution administered intravenously was the only thing that caused a decided raise in arterial tension. As to the danger from its use where HEMORRHAGE is NOT present, I believe it can be used in reasonable amounts with impunity. It is eliminated so rapidly that I can hardly see how so transient an increase in the volume of the blood would overtax the heart muscle, as suggested by Dr. Payne. As to the temperature of the normal salt solution the Doctor mentions 115 degrees to 118 degrees Fahrenheit. I would hesitate about using it at that temperature. I believe that 110 degrees Fahrenheit is as hot as should be used. Temperature of the solution to be taken before it leaves the irrigating bag.

Dr. G. A. Baxter, of Chattanooga, Tenn.: Dr. Payne has struck the point that entered my mind. I am not prepared to abandon these drugs, especially ammonia, in the treatment of shock. I have tried to discriminate between the use of these drugs. Nitroglycerine and strychnine have just the opposite effect upon the blood vessels.

The normal salt solution has two effects. After hemorrhage it fills the vessels and enables the heart to contract. When used under the skin where there is no hemorrhage it is vastly deleterious; it makes the heart work harder and defeats itself.

In cases of shock and used very hot in the bowels, it will give good effect if it is not used in too large quantities.

There is another condition of shock which is often overloooked and which often results seriously. As an illustration, a man was carried thirteen miles while suffering from shock, and this transportation produced additional shock from which the man died. Therefore I think that we frequently overlook the fact that moving a patient while in a condition of shock produces additional shock. I remember another case in which there was loss of blood and an amputation had been done. He was urged to be kept upon his back. A nurse was put by him to see that he did not raise up. There was an alarm of fire, the nurse went to the window, and the man attempted to rise and dropped back dead. I think that this is one consideration that we ought to bear in mind. Frequently the patient is suffering with too much shock to operate, or even to be moved. We should wait until the pulse has restored itself to a certain degree before undertaking the additional shock of an anaesthetic and operation. The question of shock is the first thing to be considered by the railway surgeon.

There is another condition which we sometimes overlook, and that is real injuries which are obscure and not discovered immediately but which produce shock. For instance, a contusion of the brain without fracture, or laceration of the liver without evidence externally. We should make certain that we are dealing with shock alone in these cases. We should carefully investigate to find the cause for shock before proceeding further.

I have not tried the adrenalin in the treatment of shock, but I believe it affords some stimulation where stimulation of the heart is needed.

THE RELATIONS OF THE SURGICAL AND LEGAL DEPARTMENTS.*

By Hon. SANDERS McDANIEL, Division Counsel, Atlanta, Ga.

About two years ago a paper of mine was read before your body upon a subject similar to the one which you have done me the honor to assign to me to-night. One of your members, and a good friend of mine, has suggested that a speaker having murdered a topic by his unskilful treatment of it should not be permitted to hold an autopsy over it.

But with all modesty I can point to at least one suggestion made by me in that former paper which time and the wisdom of the management of the Southern Railway Company has vindicated, to wit, that you should be organized into a distinct department with a chief surgeon at the head. I do not mean that my suggestion was the discovery of the idea. The need was apparent, and your able chief surgeon is the result, and a compact, harmonious organization will follow with the more complete usefulness and *esprit de corps* which departmental union brings.

THE RELATION OF THE SURGICAL AND LEGAL DEPARTMENTS.

The department of which I am a representative touches at all times and everywhere all the affairs of the minutest subdivisions which go to form the corporate whole. It is present at the birth of the corporation —the law is its creator. It counsels in traffic matters; it advises in physical operations; it guards in title and ownership; it defends from attack. At all times and everywhere the guardianship of the legal department is present with the corporation, and should it die, its dissolution would be through legal processes and it would breathe its last in the lap of the law.

The office of the medical department to the railway company is in the broadest sense threefold. It is economic, in that it is your duty to save to the company in medical expenses incident upon the injuries resulting from the dangerous agencies necessarily employed in modern transportation of persons and things. It is humane, in that you chiefly ameliorate the sufferings inevitable upon the present day railroading, and thus as the representatives of the company perform for it its moral and legal duties in this respect. And finally, it is protective, in that your aid and services are required to prevent its victimization from fraudulent claims and plunder through forms of law; and here you come in close union with the law department, which closes ranks with you for the battle which rages about the personal injury damage suit. For in the successful accomplishment of its work the support and aid of the company surgeons is imperatively demanded by the company's lawyers, and I cannot emphasize too strongly our dependence upon you in personal injury settlements as well as in personal injury litigation.

How dependent we are upon you! How much more—hear the humiliating confession!—are we dependent upon you, than you upon us. There are some laws which you are compelled to know. This is necessary because you must hold and protect the fortunes which you have amassed out of the misfortunes of your fellow men, and because you desire to enjoy this wealth outside of prison walls; and to do so it is necessary for you to have some knowledge of the laws which you may with impunity transgress. On the other hand, we give no thought to the laws of medicine until our bodies suffer and then we pathetically call on you for their administration; and we know nothing of anatomy until you teach us a little in connection with the particular phase of a particular case, and then we rejoice that we can so easily forget what we have been taught when the case is at an end.

I believe that the railroad surgeon's connection with a damage suit, where the injury to the person is denied or where its extent is disputed, and his responsibility in reference to it, should go infinitely beyond the mere giving of testimony in the court room. The medical feature of all cases should, in my opinion, be prepared in a large measure by the medical department. The live, active and intelligent presence of the proper surgeon should attend upon every stage of the development of every case involving a fraudulent or an exaggerated claim of injuries. The odds in the courts are greatly against us (to say this is to merely utter a platitude, so well known is the fact), and these in some measure should be offset by diligent and organized preparation on your part as well as on that of the lawyers and law agents.

The advantage of a surgeon-in-chief will be apparent in this connection. His office will require constant information; details of all sorts of necessity will be furnished him, and his eye through you will be upon every injured person until the balance is struck in or out of the court, and legal adjustment has given the railway company its clear and final acquittance.

The relations of the surgical and legal departments will become closer, now that the surgical department has its own head, and now that all of you have a common authority to which you report, instead of to the several divisional officers of an intensely busy transportation department, primarily concerned with the immediate pressing details of operation. And I predict the most satisfactory results from the cohesion of your hitherto scattered ranks into a body with a common chief, because your relations become closer to us as your individual aid to us becomes more tangible, in that henceforward it will be a matter of record common to the medical department. Then, too, your responsibility will be increased by force of the facts that not only your treatment of the patient will be noted and pass under the scrutiny of your chief surgeon, but further because the result in the settlement or in the judgment of a court will become a lasting record of how you performed your part of the duty which jointly with the lawyer or law agent is owed to the company.

No measure of responsibility should be shifted from the trial counsel—I should never advocate this—but, heretofore one inquiry alone has followed the outcome of trials for personal injuries, to wit: How did the lawyer manage the case? I desire to see another inquiry added in the future: How was the medical part of the case prepared and presented?

The legal department, no matter what exigency may confront it, will never ask your support for other purposes than the ascertainment of truth, the overthrow of error, the defeat of wrong. We would sully the standard of our own profession did we ask you to lower that of yours. But we do demand that you be definitely and decisively charged with your fair share of responsibility in repelling the attack upon the revenues of the company—the attack which assumes its most dangerous phase in the fraudulent personal injury damage suit and which every day seems to become bolder, more aggressive and more shameless. The sacred rights of property seem to have no meaning in the minds of men, seem to make no appeal to the consciences of men, when asserted by and contended for by the great public corporations of the day. We of the law department do demand that you be active allies with us in the fight upon this evil. Give us the benefit of your knowledge of medicine and of man. Help us to expose pretence and sham; make manifest the malingerer before he reveals himself after verdict and recovery, when the object for feigning has been accomplished and the further necessity for it ceases to exist.

Let me point out just now what I conceive to be a pressing need of the hour. The personal injury damage suit has grown to tremendous proportions within the past two decades. This is partly due to the fact, of course, that railroading on a more extensive scale has followed the commercial development of the South and Southwest in the past quarter of a century. More and faster trains have been put in operation to meet rapidly increasing needs; more appliances have been put in use; the increase of employees has swollen all departments; personal injuries have in consequence grown more numerous. But the courts have been increased and their dockets have become congested far more by damage suit litigation proportionately than by any other branch of the law. Indeed, I believe it to be true that litigation of other kinds has been rather on the decrease and in an inverse ratio to the commercial growth of the section traversed by the Southern Railway and its allies.

Now within this period, within twenty years, great numbers of men have gone out from the portals of the courts into private ways with money recoveries for permanent injuries which were not manifest. Why should not these cases be followed and a record be made of those who are healed only after the court had adjudged that their injuries were permanent *and could not be healed*, and only after the application of the potential pecuniary plaster. Cannot some concerted effort be made to collect these cases? They are within the knowledge of all of us. If so, public demonstration can be made, that fully ninety per cent. of them were frauds and represented impositions upon justice. What more feasible plan can be devised for the prevention of future frauds than the exposure of those belonging to the past?

There are a great many particulars and details which I might discuss and illustrate how and wherein you are jointly concerned with the legal department. I could call attention to the many points at which our respective departments touch, but I lack the time to do so and cannot trespass upon your patience to such an extent. The touchstone of your value to the law department, and thereby to this great railway system, is your responsibility with the lawyers and law agents in personal injury litigation and settlements. Your department and mine earn nothing for the corporation; we spend without bringing in. The expenditures for personal injuries have been growing until they have attracted attention in the very highest quarters of the system. Now, it does not avail us to say that another department is responsible. We are not here to consider the delinquencies of other departments. We should put ourselves on trial first; and first ascertain if we are worthy by reason of our own feats to criticise and sit in judgment. We must consider how we shall meet the situation handed up to us, whether responsible for that situation or not. We are responsible for the manner in which we deal with it. It is true that we do not cause the injuries, but it is our duty to dispose of them and to avoid extravagance in so doing. We of the law department are responsible in a larger measure, no doubt, but you are also to a great extent.

To-night, let us look at the fiscal features of our joint relations to the Southern Railway Company. What can we do, what must we do to diminish the constant drain upon the Company's treasury? Here are leaks for which we are responsible; they are before our eyes. What are we doing to stop them?

If words of mine can avail to arouse you to a full recognition of the value of your help at what I may term this crisis of the law department—for is it not a crisis, when the expenditures of our client for personal injuries alone yearly amounts to a fortune beyond the avarice of the ordinary man in the South? If anything I may say can deepen your feeling of responsibility for the part you have with us in the obvious duty of retrenchment which lies ahead, I will bless the task I may have performed. For this splendid body of men to enlist their intelligencies and energies to the utmost to repel rapacity and plunder, means for the future less pay for pretended pain, less gold for graceless grunting. It will mean no abatement in the measure of justice to be accorded to your fellow man, but it will mean a nearer approach to justice for the railway company which we mutually serve and to which all owe loyalty.

DAMAGE SUITS FOLLOWING RAILWAY INJURIES—ILLUSTRATIVE CASES.

By CHAS. P. GORDON, M.D., Dalton, Ga.

Some of the following cases are reported briefly as illustrative of the methods practised by employees and others in obtaining money unjustly and fraudulently by suits in courts for alleged railway injuries. An employee, a brakeman on the top of a freight car, struck his head against a bridge under which the train was passing; he was found in an unconscious condition from compression of the brain. Examination revealed fracture of the right parietal bone, extending slightly into the frontal through both tables of the skull. Singularly enough the injury had been diagnosed and treated by the attending surgeon as one involving only the external table of the skull, the fragment being so firmly wedged that it could not be removed without the use of the trephine. A small one was applied and a depressed fragment one inch and a half long and triangular in shape was removed; the man made a rapid and uneventful recovery.

In operations on the cranium the writer would recommend the trephine instead of the mallet and the chisel, as advocated and practised by at least one distinguished member of this Association, especially in cases involving criminal prosecution, as the mallet and the chisel might afford the astute lawyer the opportunity of holding up to the jury the picture of the athletic surgeon hammering the cranium during an operation, and himself causing the fracture rather than the assailant. This objection to the use of the mallet and chisel, however, would not prevail in railway surgery, as the defendant company might find the same plea available in avoiding the responsibility for the injury.

An employee was running on the top of a freight train at night; the train separated and he went down between the cars, producing Colles' fracture of both wrists, and compound fracture of the left tibia and fibula. The fractures were carefully reduced and plaster-of-Paris bandages applied with good results in each instance. The writer would earnestly advocate the use of plaster-of-Paris bandages in preference to splints in all cases of fracture wherever adaptable.

A boy, nine years old, was swinging to a freight car, when letting go he fell with one leg under the wheels, crushing it several inches below the knee, and causing simple fracture of the femur of the same leg at the junction of the superior and middle thirds. Amputation of the leg below the knee was done, and the fractured femur was set in a plaster-of-Paris cast. The stump failed to heal perfectly and the fractured femur failed to unite, notwithstanding a sixty days' effort. Amputation of the thigh was finally done, when the lower fragment was found in a carious condition; recovery quickly followed.

A negro tramp walking on the track was knocked off by the engine, causing concussion of the brain, compound fracture of the bones of the left forearm, fracture of the right femur, and crushing of the right foot through the tarsal bones. Chopart's amputation of the foot was done and the fractures set in plaster casts, resulting in the healing of the stump and union of the fractured bones, including the femur. Failure in one case, success in an apparently similar one. Why?

A passenger was on a train when a slight collision occurred. He claimed to have received spinal injury resulting in diabetes mellitus. He was immensely corpulent, weighing three hundred pounds. He was examined by the writer very soon after the alleged injury and no objective or visible signs of injury either local or constitutional were found. He sued the railway company for twenty-five hundred dollars. The court ordered an examination made, when he was found to be the subject of glycosuria, and was awarded twenty-five hundred dollars damages. While we do not allege that fraud was attempted or practised in this case, the writer believes that this was a case of fat man's diabetes, and not caused by the alleged railway injury. Nothing more was ever heard of the diabetes after the case was settled. Austin Flint, in his work on the practice of medicine, mentions the fact that when fat men are the subjects of diabetes mellitus it is markedly less formidable than in those of spare habit.

An engineer was in a wreck and claimed to have lost the sight of an eye in consequence, with other injuries. The writer happened to be in possession of the knowledge that he had almost lost the sight of the eye years before the accident from granular conjunctivitis, resulting in opacity of the cornea; it is unnecessary to state that the suit for damages failed to a large extent.

A passenger was in a wreck, and being thrown forward on the seat, alleged that his chest was injured by the fracture of two ribs, resulting in traumatic pneumonia. The writer was sent to another State to make examination, when it was found that the man was the subject of pulmonary phthisis; it was proven at the trial in a suit for damages that he had pulmonary consumption for years before the alleged injury; he was awarded by the court a nominal sum only.

An employee received a slight injury of the head in a railway accident and alleged that deafness resulted. The fact was within the knowledge of the writer that the deafness existed before the injury. Notwithstanding, the writer not being a witness in the case, the plaintiff recovered one thousand dollars for deafness caused by disease and not by the injury.

The writer would impress upon the railway company the necessity and importance of having physical examination made of all employees before employment, and record made in order to be protected against fraudulent damage suits.

(DISCUSSION OF PAPER BY DR. GORDON.)

DR. W. C. CONNALLY, of Dallas, Ga.: I regret that I could not have been here at the time that Dr. Gordon's paper was presented, as I lost the gist of it. Nevertheless, I know that the paper apprehends one of the most important features of our relation to the Southern Railway Company, and that is, where we can be legitimately used to protect the Company in railway damage suits. Instance after instance can be called to mind where the malingerer crops out. I remember at Old Point Comfort I gave a detailed account of something with results of greater magnitude than ordinary cases. A mail clerk was making his regular trip, and the car turned over on its side and slid down 70 feet. It was a combination car and one end was for baggage and the other for mail. The mail clerk crawled out of a window and assisted in pulling the things off of the baggage-master. He worked around there about everything. He was naturally an officious fellow. I knew him long years before the accident. I think he assisted in everything that was necessary before I arrived, and just about the time I got there he thought about a damage suit, and he immediately ceased all operations and went into a car and said that he had just found that his back was severely injured. When I got there he was covered up with a quilt. His pulse was normal and his heart's action regular. He was an athlete and well built fellow. He lived in my town and I got out of the car and walked with him a quarter of a mile and took him home. I looked after the other injured, and, to make a long story short, after carrying him home, he was put to bed. They decided they wanted another doctor. I did not object, and notified my superintendent of the affair. That fellow got another doctor who was capable of "strategy, treason and spoils." The report was circulated in that neighborhood that four joints of the backbone were broken up and had to come out. He sent him off across the country in a temporarily improvised conveyance to Cartersville, Ga., to another doctor who was just as capable as he was. They put that man in Sayre's plaster-of-Paris apparatus. He was kept in that a week or two and came back home and was able to sit up in a buggy, and he would drive up town and his friends would assist him out, and on his crutches he would drag his feet along. One day my son and a young friend had been out bird hunting, and they were near this man's house, and when they came into the main road, it seems that this man had started off in his buggy but evidently had forgotten something and drove back to a. post 200 or 300 feet from the house, and just as my son and his friend came into the road they saw this man drive up to the post, jump out of the buggy and hitch the horse and then run into the house without any crutches. Yet when he drove down town, or any one was around, he would have to be helped out of the buggy and could not get about without the crutches. His lawyers got $8,500 out of the old E. T. V. & G.

In another case a man was knocked down by the train, but outside of the rails, and he fell with his feet against the rails, the flat of the wheels running over his feet. The space between the chert and the wheels was not sufficient to admit the feet, and one foot was badly mashed. There were three fractures of the metatarsal bones. I told the law agent to pay him something, but that man would not talk of settling out of court.

The other case brings up to the point. I have got to be used as an expert. A man is suing the Southern Railway because his wife died. He lived by the side of the railway, and there was a stream running by his place, and it came down near the railway and then turned, making a little lake. He is suing the railway for causing malignant malarial fever. The doctor who was treating the case would pass my office every day, and he was also capable of "treason, strategy and spoils." I diagnosed the case as typhoid fever, and I think it was contracted from washings from the cow lot which is just about fifteen feet from their water supply. He has already gotten judgment for $500. In these rural districts the case is decided by the jury in favor of their lawyer, and not on the merits of the case.

In all cases the best plan is to get the statement of the injured party at once, and make a note of it, as he may alter that statement within twenty-four hours.

Dr. Baldwin: This is a most interesting paper on an interesting subject. We have these cases to contend with and they are very annoying. Personally I dislike to go before a court in any way. We are often insulted, but we are responsible for this to a great extent, as the lawyer assumes a position that we should not permit. They try to make it appear to the jury that we don't know very much about anatomy. I don't hesitate to address the court and call them down. If we make a point of it we can stop this thing.

I remember one case that will illustrate one point that I want to emphasize, and that is, to make a thorough examination when you see the patient, and as Dr. Connolly says, take his statement in writing then and there. A few years ago I was boarding at the hotel and one day was standing in the office and heard that there had been a wreck on the road, and I made inquiries and found that nobody was hurt. I was standing in the office when the train came in. Among the passengers was a gentleman fifty years of age, whom I had known. When he came in he said he was in the wreck, and said that the wreck did not amount to anything. He walked around town for some hours, and at two o'clock he came into dinner and began to complain about his back hurting. I told him to go up stairs and I would examine him. He said he did not have time. I insisted upon examining him. but the last I saw of him he was going upstairs. That man brought suit against the road and it has been in the courts ever since. A doctor in Birmingham gave his testimony some time after the man was hurt, that he was injured for life. Since then the man has been walking with a stick and complaining of his back. The doctor has made the statement that he is injured for life. I am going to have the lawyer ask him how he is injured?

Dr. J. U. Ray, of Woodstock, Ala.:This paper should have been read at first and discussed every two hours during the meeting. It is the most important paper that has been read before this association. It brings out the question of damage suit cases and the Company. The Railway Company does not employ us as railway surgeons for our benefit, but for their protection in damage suits. The railways are often imposed upon. As an illustration, two trains collided. The engineers saw one another and almost stopped the trains before they came together, and the pilots were bent down just a little. The trains had been standing for twenty minutes. A passenger asked the Pullman conductor what was the trouble, and he said that they were in a collision. The passenger immediately jumped out of a window and rolled down the embankment, and afterward recovered $1,800 damages. You can thus see how the railway is imposed upon.

Recently I was in a case as a witness where an old negro woman had been to town to get drunk. The train stopped at the station but the woman stopped to talk to some negroes and the train started off. The conductor discovered that she wanted to get off and stopped the train and told the porter to put this drunk woman off. As he put her on the ground she fell. Three months later I was sent to examine this woman, and at first she refused to be examined, but she finally consented. She had claimed paralysis of the right arm. I examined this as best I could and found it as healthy as the other arm. Soon afterward the case came up, and the old darkey was in court with her arm down by her body, but when the clerk went to swear her to testify her right hand went up. The case went to trial and the jury gave her a verdict of $1,000.

Dr. C. A. Teague, Graniteville, S. C.: I wish to say just one word. I think that after we find that we are needed anywhere that the next thing is for us to get pencil and paper, and make a record of what we find; for quite often there is a feeling among the patients from the time of the supposed wreck that they must build a case. Quite often, if you ask them if they are hurt they will refuse to say anything, but will let the truth out and say that they have sent for their lawyer. The statement at the time of the accident is very important.

Dr. J. H. Mitchell, of Mount Vernon, Ill.: The doctor spoke of examining men as to their qualifications before entering the service of the Company. Last winter, on Christmas Day, over on the St. Louis division, a head end collision took place between two passenger trains, due to the fact that the operator overlooked his "hand," and failed to place the red signal. The evidence that will be brought to bear in that case is that the young man was not physically qualified for the position. He was evidently physically weak, was a consumptive, and at the inquest it was claimed, or such is the general impression, that the Company, for the sake of cutting down expenses employed this individual at a low price. There will follow claims for a vast amount of damages, whereas if the man had been required to stand a good physical, moral, and mental examination, this accident might not have happened.

Dr. Geo. H. Moran, of Morganton, N. C.: I am satisfied that if the entire Association were present that we could relate incidents from now until the meeting in Charleston. What I want to know is, what are we going to do about it. I have always made a complete record but it does not have a bit of influence at all. The jury is carefully selected by the counsel and their sympathy is with the man.

Dr. W. M. Cunningham, Corona, Ala.: The first statement made by the patient does not always count very much before the jury. A man may not think he is hurt at the time of the accident, and afterward get damages before a court. I think sometimes the Law Department makes an error in meddling with these cases so much and trying to get them to make statements, and talking to them. For instance, not long ago the dispatcher called me up and had me go to a wreck and get a statement from every passenger on the train. I got every man's statement carefully. I left and was asleep again, when he called me up again and told me to go through the car with the conductor and get each passenger to state whether or not any one was hurt. We did that, and by this time they had been asked so many questions they were getting angry. One man said he was not hurt and wanted to be left alone. Next day a lawyer went to see this man, who had taken a little cold and claimed that he was hurt and wanted damages. The doctor who examined him said that he had some ecchymosis on his side. He had taken a bath when I saw him and the ecchymosis was gone. He was paid $100 to settle the case.

We are not here to criticize the Law Department, but if they could view the matter from our standpoint, they would often let these cases alone.

Dr. W. W. Harper, of Selma, Ala.: I want to report one case. Two men were talking together, one had been injured several years before and had sustained a very serious injury of the back, which brought about quite a lump upon his back. They were without money and they hit upon a plan to get some. They went to a place where some excavations were going on, and the crippled one got down in the place, and the other began looking down in the hole and soon got a crowd around and told them the man down there was hurt. Some policemen got him out and he was hauled away in an ambulance, and he got $5,000.

Such cases in the employ of the company could be averted by an examination of the men before they are taken into the service.

The Company is often imposed upon. I remember one case that brought suit and was on crutches. He was offered $200 to settle the case, and he started walking again.

Dr. W. A. Applegate, Chief Surgeon, of Chattanooga, Tenn.: I just want to say this. I did not hear the paper, but I take it that it was something that this will be in keeping with, and that is this: We are going to adopt the plan of requiring the examination of all men who are employed by the company, the man undergoing an examination similar to that required for entrance into the army. We are not going to take some old injury and have it come back on us for damages. I am having some forms made at present, and as soon as I can get them completed you will hear from me, and there will be some of these blanks sent around to the various division points where they employ these men. The surgeons at small places will not have much of this to do, as they go to the division points to be employed. That movement is on foot and will go through. I cannot say how soon it will be adopted, but we are going to take it up.

Dr. Ray: Are you going to include an assessment of employees so much each month?

Dr. Applegate: That will come up later, but not now. This matter has been suggested by me to the Company. My reason for proposing it was that I just had a case come to my attention that claimed to have been injured by being thrown against a seat. He happened to be a negro, but it was not severe enough for me to see it. He got an outside physician who was glad to give advice. They were trumping up a nice case. He had an umbilical hernia as large as his fist which had been there ever since he had been born. I hunted the man up and asked him where he was hurt, and why he did not tell me about it. I told him the hernia had been there ever since he had been born. He acknowledged that, and I asked him if he wanted his job. He went back to work.

This brought the matter to my mind, and I went to Washington about that time, and as soon as I was called upon as to what should be done in this matter this case came to my mind, and they were heartily in favor of the plan. They are just waiting for me to get up proper forms before adopting it.

There seems to be a little misunderstanding with reference to the appointment of consulting surgeons. I don't want any of you to feel that anything of that kind will be done that is going to lower your rank. I would like to have you select some one you would like to have work with you in the emergency cases, and name this party to me. We want to have some definite arrangement with him as to what it will cost us. I don't want them to come in with just any sort of bill. I don't want them to be sore with you with the idea that you got them to accept a fee less than they are now getting. They are to be at your call, and when you want some one they are to be called upon. They are to accept fees that you are getting. I don't want you to think that we are going to have some one over you. That is not the idea. I want you to make the selection. I don't propose to select them for you at all. If it is deemed advisable we will appoint that man.

Dr. C. P. Gordon, of Dalton, Ga. (in closing): I will say, gentlemen, that I have been a railway surgeon for a good many years, and I desire to compliment the Legal Department and the railway management in all these damage suit cases so far as I am concerned. In all the cases I have never been approached by any railway manager, or counsel, and had it insinuated to me that I was expected to testify to anything but the truth, the whole truth, and nothing but the truth. I believe the railway company is willing to pay all legitimate damages.

I desire to discuss accidents to the cranium. I am opposed to the chisel and mallet. I would be opposed to Dr. Nicholson's operation, except in large loss of bone. Nature will close all these operations. I don't want to put in so much foreign matter, and I don't want the tack hammer used.

In reference to fractured ribs, that is a favorite complaint. They usually claim two or three ribs were fractured. When they are fractured the rising and falling of the chest does not keep the parts in apposition and you have a callous formed, and nature puts the callous on the outside. Whenever a rib is fractured the callous is present.

In regard to the case of diabetes mellitus, he was so correct in his testimony that he gave the anatomical relations.

I had a very distinguished patient. In a wreck below Dalton, Madame Nordica was in her special car. There was a collision. I was the first surgeon on the ground. I was carried and introduced to Madame Nordica. I was charmed with her voice. It was the most musical voice I ever heard, and I am still under its spell. She was sitting there laughing and talking. I told her I was glad to know that her voice was not injured in the wreck. She said she was thrown from her berth and had hurt her shoulder a little. I told her I would like to examine her for any injuries. She replied that "it was nothing, and only needed a slight massage." She went on and filled her engagements, but brought suit against the company for $50,000, and that suit is still pending.

SOME SUGGESTIONS TO OUR CHIEF SURGEON.*

By W. K. VANCE, M.D., Bristol, Tenn.

The annual meetings of this Association are for the purpose of bringing us together in order that we may compare experiences, discuss surgical subjects, and thereby increase our knowledge of surgery in general and railway surgery in particular; also for considering any subject which may properly come before us pertaining to the welfare of the surgical service of the Southern Railway.

I deem the time auspicious for calling the attention of this Association, and our new Chief Surgeon, to two or three matters which I think of importance. I shall be brief and only intend my remarks to open a discussion of these questions.

I take for granted that you all feel gratified over the fact that the management has seen fit to give us a new head. This in my judgment is a step in the right direction and should, and doubtless will be, of mutual advantage to the Company and its surgical staff. Lest my ideas be not in accord with your own, I wish to say that in presenting them I am actuated by the same noble spirit that prompted the old Georgia negro preacher, who on one occasion after wrestling long and fervently at the throne of grace, asking all kinds of blessings on himself and his flock, concluded his prayer in these words: "Oh Lord, Thou knowest all things and will do what is best for us, and in the petition just offered we wish you to distinctly understand that we do not mean to dictate but to merely suggest."

My first suggestion then to our new Chief Surgeon will be to use his influence to expunge from the vocabulary of the Southern Railway the opprobrious title, "Local Surgeon," by which we have hitherto been designated. Why not drop the adjective and let us be known henceforth simply as "Surgeons" or "Company Surgeons?" The designation *local* has a tendency to minimize our selfrespect and in some instances no doubt causes atrophy of "our bump of self-esteem." In addition to this, its use gives the general public a restricted idea of our importance and a circumscribed view of our function. In other words it makes us look more diminutive in the public eye than we otherwise would, or than we think we should appear. I think I echo the sentiment of every surgeon in the service of the Southern Railway in expressing the hope that among the first official acts of Chief Surgeon Applegate will be his recommendation to discontinue the appellation "local surgeon."

Another matter to which I wish to call attention, which tc many of us has always been "a thorn in the flesh," and that is an item on our fee bill relative to the remuneration of assistants. Surely the originators of this fee bill believed that "the laborer is worthy of his hire" only in certain instances.

In the case of major operations the compensation allowed assistants is somewhat in keeping with the dignity of our profession, but I am sure that no surgeon can reconcile his conscience to handing over to a reputable member of his profession the paltry fee of $1.66 2-3, which in some instances is all that our fee bill allows.

Our code of ethics, article 1st, section 1st, "of the duties of physicians to each other and the profession at large," says: "Every individual on entering the profession incurs an obligation to exert his abilities to maintain its dignity and honor, to exalt its standing, and to extend the bounds of its usefulness." Are we obeying either the letter or spirit of this section of the code in aquiescing in the continuance of an item on our fee bill that is repugnant to our ideas of honor to the Company, or justice to our professional brethren? Very little less responsibility or loss of time devolves upon the doctor who administers an anesthetic for a finger amputation, than on the one who performs a like service for a thigh or arm amputation. Then why this difference in the pay? The fact is it is a violation of the local fee bill of every town and city over the whole Southern System so far as I can learn, to give an anesthetic for less than five dollars, and but for the fact that we all have our friends in the profession, who will on personal grounds come to our help, it would often be impossible to secure competent assistance at the Southern fee bill rate.

That this part of our fee bill is a dead letter and not observed at many places where surgeons of this company reside I am satisfied. Would it not then be better for all parties concerned and more in keeping with the welfare and dignity of the Company and the profession, to change this item on the fee bill so as to allow the assistant in every case a stipulated amount? While valid objections can be urged against this course, I cannot but think it less objectionable than the present arrangement, and it would likely not add one cent to the expense incurred by reason of the Surgical Department.

Suppose for the sake of argument it does: That does not alter the case at all. The officials of this Company are honorable business men and would, if their attention is called to it, be glad to right any wrong being done any one. They do not ask or expect employees in any other departments to work for starvation wages. Were an engineer to apply to them for work at one-half the pay ordinarily given these employees they would at once doubt his competency and refuse him work, and unless I mistake the character and business acumen of these gentlemen, they should and do measure a member of the medical profession by the same standard.

There is one other subject which I think proper to mention. Were the General Manager and Chief Surgeon to prepare a great feast (and by the way if a hint is thrown out to Mrs. W. A. Applegate along this line it will likely be done) and issue invitations to it to the various employees of the Company, my judgment is that it would be conducted in a manner in keeping with the dignity of the distinguished hosts. Their hospitality and generosity would not suffer a part of the guests to be fed on pork and hominy, washed down with beer, while their guests at an adjoining table were being regaled with venison, wild turkey, oysters and Mumm's extra dry. The gentlemanly instinct of these two officials would cause an order of this kind to be issued to the Ethiopian waiters in swallow-tail attire: "These are our guests. Fill them to the brim with the best in the shop, and be sure to follow up the feast by serving all with the same brand of pure Havanas."

Why is it, I have often wondered, that the same course is not pursued in reference to transportation? Why are not the annual passes issued to the surgeons of the Southern Railway Company good over the whole system? It is not due to any desire on the part of the officials to curtail our transportation privileges, or to practise economy, for they have always been exceedingly kind in giving us passes over any part of the line not embraced in our annual passes and pay the bill for the clerical hire which it necessitates, and will doubtless continue to do so. Why then continue a custom that entails not only delay but trouble and expense at both ends of the line? My judgment is that the dead-head passenger traffic would not be materially increased if our annual passes were good over the whole Southern Railway. I think it would be proper and right for this Association to pass a resolution requesting the Chief Surgeon to bring this matter to the attention of the management, and ask that in future all annual passes conform to the above suggestion.

It is doubtless the experience of you all at times to have urgent and unexpected calls to travel over sections of the Southern Railway not embraced in the territory over which your annual pass applies. It is impossible to respond promptly to such calls without paying the fare, and few of us like, for the small sum involved, to annoy the Washington officials to refund the amount. The consequence is that the Company is the gainer and we the loser, and the amount involved is not so much what harasses us as the thought that we have had to pay railway fare, and you all know that there is no other cause for which we blow in our hard-earned money that cuts deeper or more keenly, unless it is betting on the wrong horse or learning that the cannibals have eaten the missionary to whose support we have been contributing.

Perhaps I view this subject in a different light from any other member of this Association, for the reason that I have long been a member of the Surgical Department of the N. & W. Ry. There we have as our Chief Surgeon, Dr. Jos. A. Gale, of Roanoke, one of the most ethical and high-toned gentlemen in the medical profession south of Mason and Dixon's line, and of course there are none north of this imaginary line to compare to him. The passes issued to the surgeons by this company at the instance of Chief Surgeon Gale are good over the whole line. There we never heard and never want to hear of a "local" surgeon. We are designated company surgeons, and the consequence is that no matter on which division of the road we travel, whether it be in Maryland, West Virginia, Ohio or Virginia, we do not feel as though we are local surgeons for this Company at our home town or city only, but surgeons for the Company throughout its whole domain.

With due respect for my brethren of the N. & W. Ry. I do not consider them more meritorious than you who represent the surgical department of the Southern, and in my judgment all that is necessary to have these matters which I have mentioned viewed in the same light by the officials of the Southern that they are by the officials of the N. & W. is to have them brought properly to their attention.

(DISCUSSION OF PAPER BY DR. VANCE.)

DR. W. C. DAY, of Danville, Va.: As I understand this paper. Dr. Vance would like to have the surgeons treated with the same dignity and put on the same footing as the lawyers of the Southern Railway. They have not only annual passes over large districts, but also have Pullman passes. Captain Green said that he did not class the surgeons as officers. If not officials, what are we? I ask that the Chief Surgeon will use his efforts to put the surgical department on the same footing as the legal department.

DR. S. R. MILLER: We have a visiting Chief Surgeon present, and I move that we hear from him. Carried.

DR. E. DENEGRE MARTIN, of New Orleans: I extend to your Chief Surgeon my deepest sympathy. If he comes to all the meetings he will have more suggestions than he can carry into effect. When I became surgeon for the N. O. & N. E., I found nearly all employees and those in charge of employees absolutely ignorant of antisepsis, and every man injured was covered with cob webs, axle grease, etc., and all the cases were infected and slight wounds suppurated and sometimes had extensive lesions following as a result of this infection.

I issued a card with instructions how to act in emergencies. The card stated that the wound should be cleaned immediately and dressed with clean cloth. That the man was not to be filled with whiskey, as he would then be considered drunk and would lose his accident insurance. These cards were forwarded to all the men in charge of laborers and put in all the cabooses, and to-day it is the rarest thing to get a badly infected wound. It has cut down our expenses materially. The men seem to realize the success of this treatment, and I assure you it is a step forward.

Dr. Geo. E. Davis, Laurenceburg, Ky.: There is every reason why the company should be liberal in its policy with the surgeons. If a case does not need any great attention these patients then go to another doctor who may take advantage of the situation to advise the patient to sue the company, when if the local surgeon is advised to continue the treatment the company is protected from unprincipled meddlers. For this reason alone the company should be very liberal. These fees should be double what they are.

Again, in regard to the dressings, they expect you to furnish most of these dressings. I think if they would provide some fee for this it would be much better.

Also, when the surgeon is called as an expert witness to stand between the company and unjust suit, he does not have the privilege of charging for expert services. I think it would be an advantage to the company to appoint men along this line.

Dr. Ross was called for.

Dr. Geo. Ross, of Richmond, Va.: It had not been my expectation or purpose to take any part in this meeting, but being called I take occasion to say that I very heartily congratulate this association that it has at last come about that the wisdom and justice of appointing a medical man as the head of the surgical department of the Southern Railway has been recognized by the officers of that company. I am glad that they have appointed such a man as Dr. Applegate seems to me to be. I believe, unless I misread him very much, that he is bent and determined on doing his duty, standing for the rights of our profession, for its elevation to and maintenance upon a high plane of action. Thus believing, I will say a few words that may not be very helpful, but will, I hope, be received by the doctor as an earnest expression of my desire to aid him as far as I can in the work he has before him. I have very clear views in regard to railway work and I never hesitate to express them. It was my fortune to be complimented by Mr. E. B. Thomas, a former general manager of the old R. & D. R. R. Co., with the title of "Chief Surgeon," and directed by him to organize a surgical department of that system. I immediately began this work, and many of you here present know the formative and finishing steps of my administration. I determined to know but one thing in the matter: "To be just and fear not," to carefully guard my own honor, and the honor of my profession as well, to recognize the justice of a reasonable compensation for the labor and responsibility that a surgeon assumes in the treatment of any case committed to his care, and I fixed such a tariff of charges that while not quite as high as those paid in the larger cities, were yet higher than most of the country doctors were receiving. That fee bill was accepted by the railway management, and as far as I know was never objected to by any surgeon serving under it. I do not recall that there was a single law suit in ten years brought against the company growing out of the incompetency or negligence of any surgeon serving it. The bills presented under that fee bill were paid every thirty days. If there was criticism of the surgical department from any source the fact of such criticism never came to my ears. As might have been expected, I could not obtain many things that the department needed. I recall the fact that on one occasion additional stretchers were required, and I made personal requisition on the general manager for them. You would be astonished at the answer I received: "Railroads should not have stretchers; they should not need them." I promptly corroborated the declaration that they should not need them, and as frankly asserted the fact that they did need them constantly. I got some stretchers. There were other things I could not get, and that Dr. Applegate will get. Fortunately for him and for us, railway managers have traveled a good many miles down the hill of a sad experience to reach the high hills from which to take a broader view of the necessities for their intelligent and successful administration. I am impressed with the belief that the papers which have been read before the International Association of Railway Surgeons bearing upon the subjects of primary dressings in railway injuries are destined to have a steadily increasing influence for good in railway work. A better provision for first aid to the injured cannot be more effectually accomplished than by having small boxes of supplies on the railway trains. Some of you will remember that I prepared slips of instruction that were distributed through the old "R. & D." trains for the care of the injured, wherein employees were directed what to do and what not to do. I think it is wise to have a certain form of class teaching in the shops where accidents are prone to happen, emphasizing always the importance and the means of cleanliness. We must have cleanliness in the primary dressing if infection is to be prevented.

The question of the "pass" which the company gives to its surgeons is one to be considered. The large majority of medical men are so situated that they cannot go off on long trips. The surgeons here present will bear me out when I say that they do little railroad riding except to the annual meetings. Their circumstances forbid it. The issuing of restricted passes is of small gain to the railroad. I do hope Dr. Applegate will elevate our association by making the compensation paid the members of his staff more nearly conform to that paid by the higher grade of railroads of this country. I think he will find that the average expense per case treated will approximate from six to seven dollars. I make this statement based upon my own past experience in the service. If he does do so, I can't believe that the treasury of the railroad company will be destructively assailed by so fair a dealing with the men in its service. I unhesitatingly affirm my belief that the more closely we can unite the men who work to the administrative department of a corporation the better that corporation will be served. Unless this is done, you must have a dissatisfied service, and a dissatisfied service means always a half-hearted service. Observe, please, that the surgeon is paid for his strictly professional care of the injured only. When he becomes the adviser of the legal and claim departments, neither of those departments pay or expect to pay a stiver for his counsel; but his knowledge of the injury and of its limitations as to permanence make his advice most valuable toward the effecting of a settlement. Such counsel is constantly sought after and is always gladly and generously given. Important, then, surely is that a surgeon should be a competent and a trustworthy man. Competency means efficiency in service, and trustworthiness means guarding the interests of both patient and corporation. The interest of the patient means curing him quickly, and the interest of the corporation means doing so at the least possible expense. The company, then, should have conscientious medical men in its service who will aid in the conducting of their department on the highest moral plane. The old "R. & D. R. R." I know had just such a body of men in its service and I would fain hope that the standard there fixed shall forever mark the men that compose the staff that pledge themselves to support Dr. Applegate. I have always maintained that the surgeon should not unnecessarily be placed on a witness stand. He is not a claim agent and should at no time assume such a role. His duty is the care of the injured, a duty to be performed as quickly and as scientifically as the case demands. It should carry with it a manifested sympathy for the injured in his suffering, and an earnest purpose to expedite his recovery as far as in a surgeon lies. His knowledge of all that pertains to the case should be held always a legitimate subject of inquiry to the legal or claim department when asked for. The surgeon should not be used, in my opinion, as an expert in the company's service, and should not be called on to testify to any facts that can be had at other hands. In other words, I do not believe it is policy for the company's surgeon to be subjected to such insults on the witness stand as "shyster" lawyers not infrequently subject him to. A legal gentleman, of course, would scorn such methods. When, however, a surgeon's advice is asked for by the claim or legal department, and a suit is submitted to, based on the advice of that surgeon, then he should stand for the company's defence in the face of all odds. I have confidence that Dr. Applegate will carefully consider all of these matters, and, I think, the association is to be congratulated on having him at its head.

I thank you, gentlemen, for your attention.